Computer algebra independent integration tests

Summer 2022 edition

3-Logarithms/60-3.2.2-f+g-x-^m-h+i-x-^q-A+B-log-e-a+b-x-over-c+d-x-^n-^p

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Contents

1 Introduction **3**

2 detailed summary tables of results **19**

3 Listing of integrals **87**

4 Appendix **1769**

Chapter 1

Introduction

Local contents

1.1 Listing of CAS systems tested 4
1.2 Results 5
1.3 Time and leaf size Performance 9
1.4 list of integrals that has no closed form antiderivative 11
1.5 List of integrals solved by CAS but has no known antiderivative 12
1.6 list of integrals solved by CAS but failed verification 13
1.7 Timing 13
1.8 Verification 14
1.9 Important notes about some of the results 14
1.10 Design of the test system 17

This report gives the result of running the computer algebra independent integration test.

The download section in the appendix contains links to download the problems in plain text format used for all CAS systems.

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

1.1 Listing of CAS systems tested

The following are the CAS systems tested:

1. Mathematica 13.1 (June 29, 2022) on windows 10.
2. Rubi 4.16.1 (Dec 19, 2018) on Mathematica 13.0.1 on windows 10.
3. Maple 2022.1 (June 1, 2022) on windows 10.
4. Maxima 5.46 (April 13, 2022) using Lisp SBCL 2.1.11.debian on Linux via sagemath 9.6.
5. Fricas 1.3.8 (June 21, 2022) based on sbcl 2.1.11.debian on Linux via sagemath 9.6.
6. Giac/Xcas 1.9.0-13 (July 3, 2022) on Linux via sagemath 9.6.
7. Sympy 1.10.1 (March 20, 2022) Using Python 3.10.4 on Linux.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 on windows 10.

Maxima and Fricas and Giac are called using Sagemath. This was done using Sagemath `integrate` command by changing the name of the algorithm to use the different CAS systems.

Sympy was called directly from Python.

1.2 Results

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

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

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

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

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

System	% solved	% Failed
Rubi	100.00 (263)	0.00 (0)
Mathematica	94.68 (249)	5.32 (14)
Maxima	68.44 (180)	31.56 (83)
Fricas	59.32 (156)	40.68 (107)
Mupad	48.29 (127)	51.71 (136)
Giac	47.53 (125)	52.47 (138)
Maple	37.26 (98)	62.74 (165)
Sympy	16.73 (44)	83.27 (219)

Table 1.1: Percentage solved for each CAS

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

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

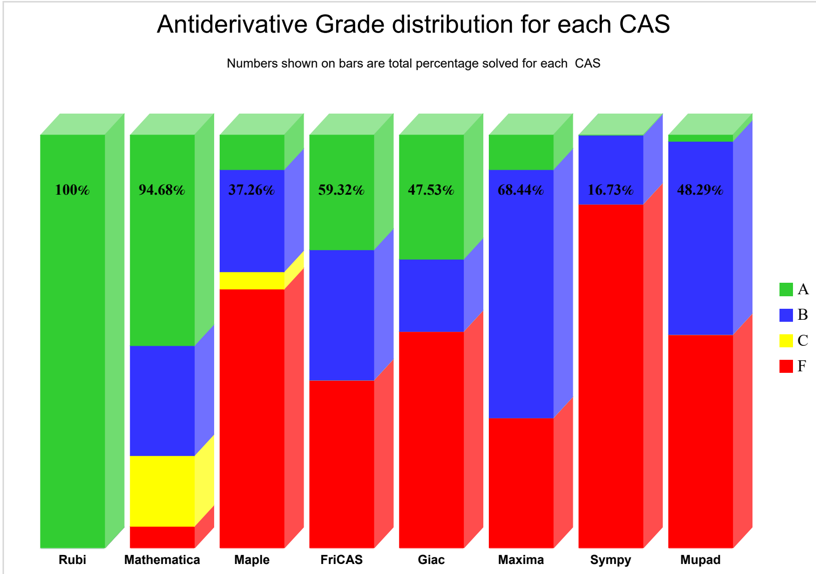
Table 1.2: Description of grading applied to integration result

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

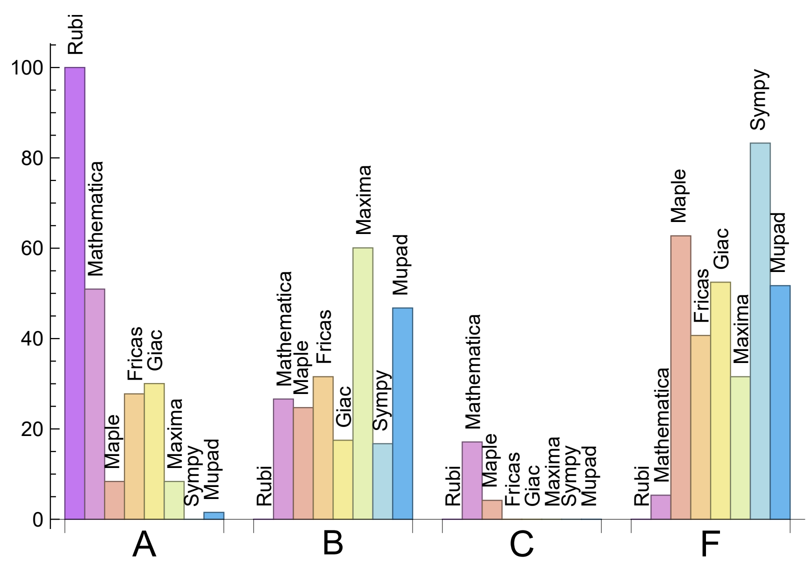
System	% A grade	% B grade	% C grade	% F grade
Rubi	100.00	0.00	0.00	0.00
Mathematica	50.95	26.62	17.11	5.32
Giac	30.04	17.49	0.00	52.47
Fricas	27.76	31.56	0.00	40.68
Maple	8.37	24.71	4.18	62.74
Maxima	8.37	60.08	0.00	31.56
Mupad	N/A	46.77	0.00	51.71
Sympy	0.00	16.73	0.00	83.27

Table 1.3: Antiderivative Grade distribution of each CAS

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



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



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

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

The third is due to an exception generated. Assigned **F(-2)**. This most likely indicates an interface problem between sagemath and the CAS (applicable only to FriCAS, Maxima and

Giac) or it could be an indication of an internal error in CAS. This type of error requires more investigations to determine the cause.

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	0	0.00 %	0.00 %	0.00 %
Mathematica	14	100.00 %	0.00 %	0.00 %
Maple	165	100.00 %	0.00 %	0.00 %
Fricas	107	100.00 %	0.00 %	0.00 %
Giac	138	89.86 %	8.70 %	1.45 %
Maxima	83	100.00 %	0.00 %	0.00 %
Sympy	219	21.46 %	74.89 %	3.65 %
Mupad	136	100.00 %	0.00 %	0.00 %

Table 1.4: Failure statistics for each CAS

1.3 Time and leaf size Performance

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

Mean size is the average leaf size produced by the CAS (before any normalization). The Normalized mean is relative to the mean size of the optimal anti-derivative given in the input files.

For example, if CAS has **Normalized mean** of 3, then the mean size of its leaf size is 3 times as large as the mean size of the optimal leaf size.

Median size is value of leaf size where half the values are larger than this and half are smaller (before any normalization). i.e. The Middle value.

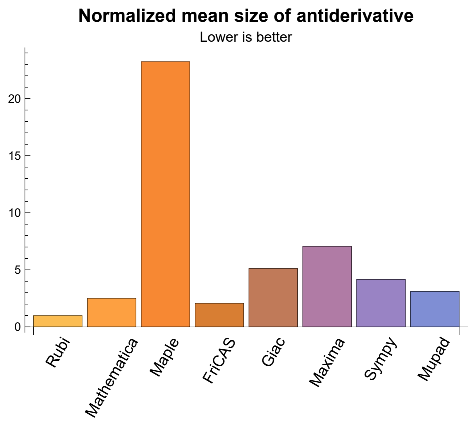
Similarly the **Normalized median** is relative to the median leaf size of the optimal.

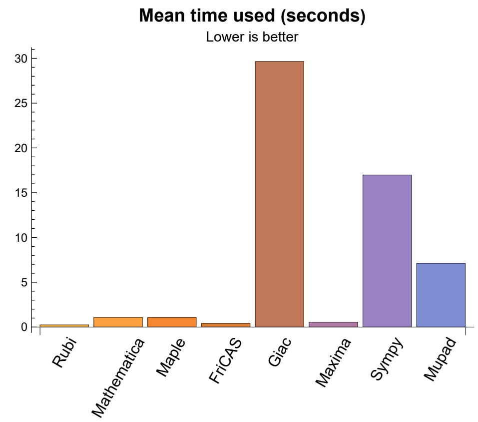
For example, if a CAS has Normalized median of 1.2, then its median is 1.2 as large as the median leaf size of the optimal.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.24	309.03	0.98	269.00	1.00
Mathematica	1.07	861.13	2.51	362.00	1.26
Maple	1.06	2265.58	23.23	630.00	2.44
Maxima	0.55	2147.46	7.06	1238.00	4.45
Fricas	0.41	571.89	2.08	370.50	1.89
Sympy	16.98	943.61	4.16	850.00	4.12
Giac	29.64	1182.25	5.11	355.00	1.42
Mupad	7.11	938.48	3.11	638.00	2.70

Table 1.5: Time and leaf size performance for each CAS

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


Normalized mean size of antiderivative
Lower is better
0
5
10
15
20
Rubi
Mathematica
Maple
FriCAS
Giac
Maxima
Sympy
Mupad


Mean time used (seconds)
Lower is better
0
5
10
15
20
25
30
Rubi
Mathematica
Maple
FriCAS
Giac
Maxima
Sympy
Mupad

1.4 list of integrals that has no closed form antiderivative

$\{253, 254, 262, 263\}$

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Mupad Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

A verification phase was applied on the result of integration for `Rubi` and `Mathematica`.

Future version of this report will implement verification for the other CAS systems. For the integrals whose result was not run through a verification phase, it is assumed that the antiderivative was correct.

Verification phase also had 3 minutes time out. An integral whose result was not verified could still be correct, but further investigation is needed on those integrals. These integrals were marked in the summary table below and also in each integral separate section so they are easy to identify and locate.

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

Since tests were run in a batch mode, and using an automated script, then any integral where Maxima needed an interactive response from the user to answer a question during the evaluation of the integral will fail.

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

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

Such integrals can be identified by looking at the output of the integration in each section for Maxima. The exception message will indicate the cause of error.

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

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

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

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

```
maxima_lib.set('extra_integration_methods', '[]')
```

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

1.9.2 Important note about FriCAS result

There were few integrals which failed due to SageMath interface and not because FriCAS system could not do the integration.

These will fail With error `Exception raised: NotImplementedError`.

The number of such cases seems to be very small. About 1 or 2 percent of all integrals. These can be identified by looking at the exception message given in the result.

1.9.3 Important note about finding leaf size of antiderivative

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

The other CAS systems (SageMath and Sympy) do not have special builtin function for this purpose at this time. Therefore the leaf size for Fricas and Sympy antiderivative was determined using the following function, thanks to user `slelievre` at https://ask.sagemath.org/question/57123/could-we-have-a-leaf_count-function-in-base-sagemath/

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

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

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

  except Exception as ee:
        leafCount =1
```

1.9.4 Important note about Mupad results

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

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

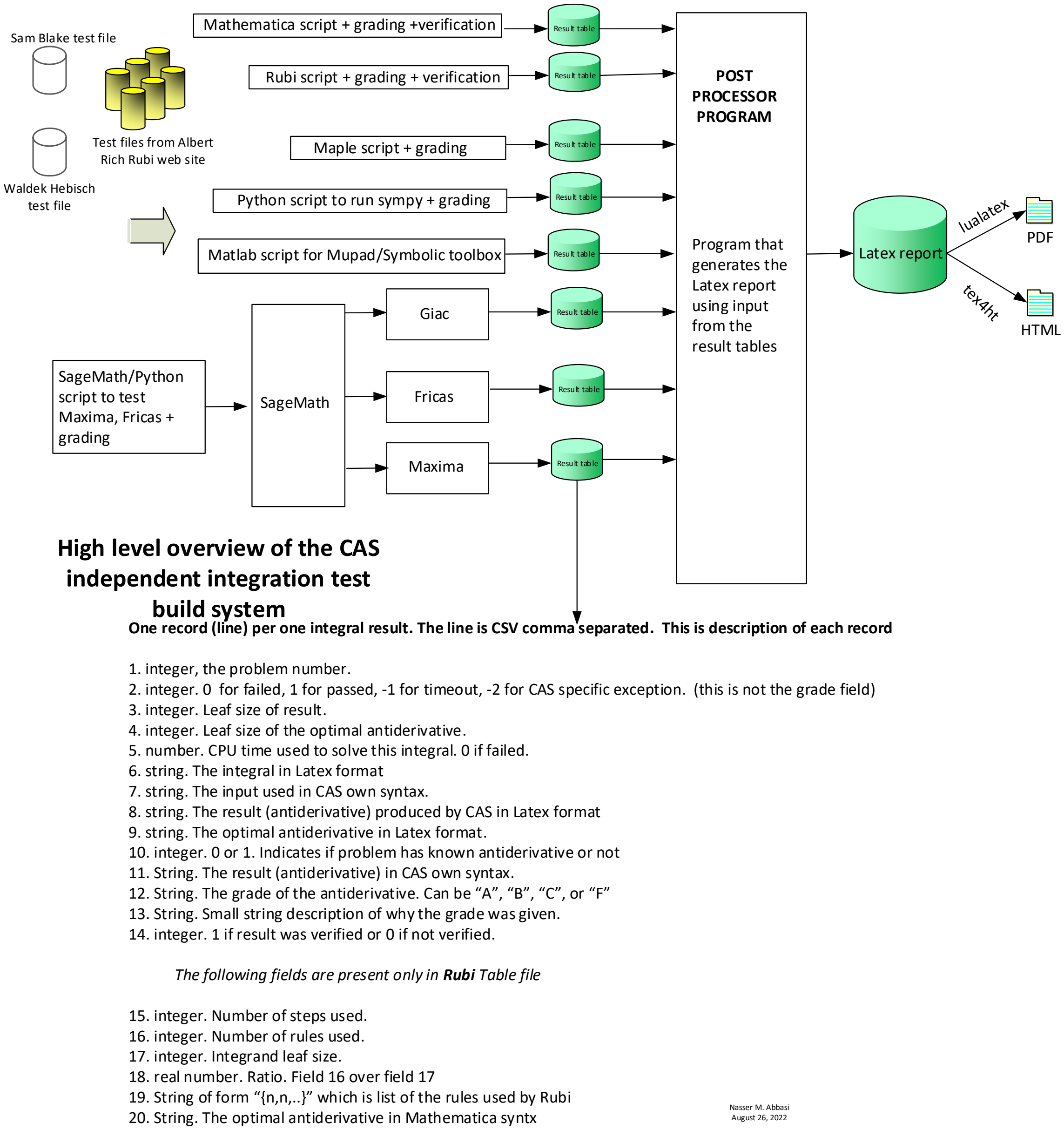
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.10 Design of the test system

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



Chapter 2

detailed summary tables of results

Local contents

2.1 List of integrals sorted by grade for each CAS 20
2.2 Detailed conclusion table per each integral for all CAS systems 25
2.3 Detailed conclusion table specific for Rubi results 78

2.1 List of integrals sorted by grade for each CAS

Local contents

2.1.1 Rubi 21
2.1.2 Mathematica 21
2.1.3 Maple 22
2.1.4 Maxima 22
2.1.5 FriCAS 23
2.1.6 Sympy 23
2.1.7 Giac 24
2.1.8 Mupad 24

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263 }

B grade: { }

C grade: { }

F grade: { }

2.1.2 Mathematica

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

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

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

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

2.1.3 Maple

A grade: { 19, 30, 36, 37, 38, 42, 43, 44, 45, 46, 51, 52, 53, 54, 253, 254, 255, 256, 257, 258, 262, 263 }

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

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

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

2.1.4 Maxima

A grade: { 4, 5, 14, 24, 33, 42, 50, 111, 112, 121, 146, 154, 231, 232, 237, 238, 239, 245, 253, 254, 262, 263 }

B grade: { 1, 2, 3, 7, 8, 9, 10, 11, 12, 13, 15, 17, 18, 19, 20, 21, 22, 23, 25, 26, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46, 47, 49, 51, 52, 53, 54, 55, 56, 57, 58, 61, 62, 63, 64, 65, 66, 67, 71, 72, 73, 74, 75, 76, 77, 81, 82, 83, 88, 89, 90, 91, 95, 96, 97, 98, 99, 102, 103, 104, 105, 106, 107, 108, 109, 110, 114, 115, 116, 117, 118, 119, 120, 122, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 135, 136, 137, 139, 140, 141, 142, 143, 144, 147, 148, 149, 150, 151, 153, 155, 156, 157, 158, 159, 160, 161, 162, 165, 166, 167, 168, 169, 170, 171, 175, 176, 177, 178, 179, 180, 181, 190, 191, 192, 193, 197, 198, 199, 200, 201, 204, 205, 206, 207, 208, 209, 228, 229, 230, 233, 255, 256, 257, 258 }

C grade: { }

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

2.1.5 FriCAS

A grade: { 3, 4, 10, 11, 12, 35, 36, 37, 38, 42, 43, 44, 45, 50, 51, 52, 89, 90, 95, 96, 97, 103, 104, 110, 111, 118, 119, 139, 140, 141, 146, 147, 148, 154, 155, 191, 197, 198, 199, 205, 214, 215, 216, 220, 221, 222, 224, 225, 230, 231, 232, 234, 235, 236, 237, 238, 239, 241, 242, 243, 244, 245, 246, 247, 248, 253, 254, 255, 256, 257, 258, 262, 263 }

B grade: { 1, 2, 7, 8, 9, 13, 17, 18, 19, 20, 21, 22, 23, 28, 29, 30, 46, 49, 53, 54, 61, 62, 63, 71, 72, 73, 81, 82, 83, 88, 91, 98, 99, 102, 105, 106, 107, 108, 109, 114, 115, 116, 117, 120, 124, 125, 126, 127, 128, 129, 130, 142, 149, 150, 153, 156, 157, 158, 165, 166, 167, 175, 176, 177, 190, 192, 193, 200, 201, 204, 206, 207, 208, 209, 212, 213, 217, 218, 219, 223, 228, 229, 233 }

C grade: { }

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

2.1.6 Sympy

A grade: { }

B grade: { 1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 35, 36, 37, 38, 42, 43, 44, 49, 50, 51, 53, 61, 62, 71, 72, 88, 89, 90, 91, 95, 96, 97, 102, 103, 104, 111 }

C grade: { }

F grade: { 5, 6, 14, 15, 16, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 39, 40, 41, 45, 46, 47, 48, 52, 54, 55, 56, 57, 58, 59, 60, 63, 64, 65, 66, 67, 68, 69, 70, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 92, 93, 94, 98, 99, 100, 101, 105, 106, 107, 108, 109, 110, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263 }

2.1.7 Giac

A grade: { 7, 8, 9, 17, 18, 19, 28, 29, 30, 37, 38, 42, 43, 44, 45, 46, 49, 51, 61, 62, 63, 71, 72, 73, 81, 82, 83, 90, 91, 95, 96, 97, 98, 99, 103, 104, 114, 115, 116, 124, 125, 126, 139, 141, 142, 146, 147, 148, 149, 150, 153, 154, 155, 165, 166, 167, 175, 176, 177, 192, 197, 198, 199, 204, 205, 206, 224, 225, 231, 234, 235, 236, 237, 238, 239, 253, 254, 262, 263 }

B grade: { 1, 2, 3, 4, 10, 11, 12, 13, 20, 21, 22, 23, 31, 32, 33, 34, 35, 39, 40, 41, 50, 88, 102, 108, 109, 110, 111, 117, 118, 119, 120, 127, 128, 129, 130, 135, 136, 137, 138, 143, 144, 145, 190, 232, 233, 245 }

C grade: { }

F grade: { 5, 6, 14, 15, 16, 24, 25, 26, 27, 36, 47, 48, 52, 53, 54, 55, 56, 57, 58, 59, 60, 64, 65, 66, 67, 68, 69, 70, 74, 75, 76, 77, 78, 79, 80, 84, 85, 86, 87, 89, 92, 93, 94, 100, 101, 105, 106, 107, 112, 113, 121, 122, 123, 131, 132, 133, 134, 140, 151, 152, 156, 157, 158, 159, 160, 161, 162, 163, 164, 168, 169, 170, 171, 172, 173, 174, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 191, 193, 194, 195, 196, 200, 201, 202, 203, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 226, 227, 228, 229, 230, 240, 241, 242, 243, 244, 246, 247, 248, 249, 250, 251, 252, 255, 256, 257, 258, 259, 260, 261 }

2.1.8 Mupad

A grade: { 253, 254, 262, 263 }

B grade: { 1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 28, 29, 30, 35, 36, 37, 38, 42, 43, 44, 45, 46, 49, 50, 51, 52, 53, 54, 61, 62, 63, 71, 72, 73, 81, 82, 83, 88, 89, 90, 91, 95, 96, 97, 98, 99, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 114, 115, 116, 117, 118, 119, 120, 124, 125, 126, 127, 128, 129, 130, 139, 140, 141, 142, 146, 147, 148, 149, 150, 153, 154, 155, 156, 157, 158, 165, 166, 167, 175, 176, 177, 190, 191, 192, 193, 197, 198, 200, 201, 204, 205, 206, 207, 208, 209, 228, 229, 230, 231, 232, 233, 237, 238, 239, 245 }

C grade: { }

F grade: { 5, 6, 14, 15, 16, 24, 25, 26, 27, 31, 32, 33, 34, 39, 40, 41, 47, 48, 55, 56, 57, 58, 59, 60, 64, 65, 66, 67, 68, 69, 70, 74, 75, 76, 77, 78, 79, 80, 84, 85, 86, 87, 92, 93, 94, 100, 101, 112, 113, 121, 122, 123, 131, 132, 133, 134, 135, 136, 137, 138, 143, 144, 145, 151, 152, 159, 160, 161, 162, 163, 164, 168, 169, 170, 171, 172, 173, 174, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 194, 195, 196, 199, 202, 203, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 234, 235, 236, 240, 241, 242, 243, 244, 246, 247, 248, 249, 250, 251, 252, 255, 256, 257, 258, 259, 260, 261 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

In this table,the column `N.S.` in the table below, which stands for **normalized size** is defined as $\frac{\text{antiderivative leaf size}}{\text{optimal antiderivative leaf size}}$. To help make the table fit, `Mathematica` was abbreviated to `MMA`.

Problem 1	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	261	9252	1026	510	1158	5563	1195
N.S.	1	1.00	1.23	43.64	4.84	2.41	5.46	26.24	5.64
time (sec)	N/A	0.127	0.159	0.668	0.299	0.462	4.639	4.243	5.377

Problem 2	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	217	4930	675	375	850	3911	638
N.S.	1	1.00	1.21	27.39	3.75	2.08	4.72	21.73	3.54
time (sec)	N/A	0.103	0.115	0.593	0.295	0.396	2.817	2.777	5.113

Problem 3	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	181	2140	363	230	498	2362	282
N.S.	1	1.00	1.29	15.29	2.59	1.64	3.56	16.87	2.01
time (sec)	N/A	0.069	0.175	0.473	0.285	0.392	1.662	4.100	4.714

Problem 4	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	70	665	146	131	253	1369	126
N.S.	1	1.00	0.86	8.21	1.80	1.62	3.12	16.90	1.56
time (sec)	N/A	0.036	0.025	0.425	0.277	0.391	1.033	3.485	4.639

Problem 5	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	164	506	219	0	0	0	-1
N.S.	1	1.00	1.23	3.80	1.65	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.197	0.081	1.302	0.335	0.000	0.000	0.000	0.000

Problem 6	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	175	531	0	0	0	0	-1
N.S.	1	1.00	1.23	3.74	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.134	0.112	1.232	0.000	0.000	0.000	0.000	0.000

Problem 7	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	208	177	570	177	384	115	197
N.S.	1	1.00	2.45	2.08	6.71	2.08	4.52	1.35	2.32
time (sec)	N/A	0.049	0.106	0.463	0.282	0.388	2.829	2.855	5.576

Problem 8	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	173	173	187	345	933	361	629	238	361
N.S.	1	1.00	1.08	1.99	5.39	2.09	3.64	1.38	2.09
time (sec)	N/A	0.089	0.265	0.535	0.320	0.385	5.077	4.466	5.866

Problem 9	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	210	516	1386	603	928	382	590
N.S.	1	1.00	0.78	1.92	5.15	2.24	3.45	1.42	2.19
time (sec)	N/A	0.123	0.315	0.582	0.366	0.380	8.474	5.170	6.458

Problem 10	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	423	423	429	14443	1747	689	1727	7651	2473
N.S.	1	1.00	1.01	34.14	4.13	1.63	4.08	18.09	5.85
time (sec)	N/A	0.299	0.241	0.764	0.331	0.491	8.942	4.057	5.887

Problem 11	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	337	337	362	8297	1170	505	1266	5571	1287
N.S.	1	1.00	1.07	24.62	3.47	1.50	3.76	16.53	3.82
time (sec)	N/A	0.228	0.168	0.631	0.308	0.456	4.450	4.098	5.342

Problem 12	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	216	4030	651	344	850	3856	636
N.S.	1	1.00	0.90	16.86	2.72	1.44	3.56	16.13	2.66
time (sec)	N/A	0.144	0.128	0.591	0.295	0.433	2.766	3.765	5.005

Problem 13	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	97	1499	272	206	491	2475	290
N.S.	1	1.00	0.82	12.70	2.31	1.75	4.16	20.97	2.46
time (sec)	N/A	0.050	0.030	0.578	0.282	0.414	1.528	5.052	4.586

Problem 14	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	276	276	252	1690	395	0	0	0	-1
N.S.	1	1.00	0.91	6.12	1.43	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.237	0.130	1.381	0.334	0.000	0.000	0.000	0.000

Problem 15	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	247	247	221	682	783	0	0	0	-1
N.S.	1	1.00	0.89	2.76	3.17	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.226	0.157	1.353	0.343	0.000	0.000	0.000	0.000

Problem 16	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	244	740	0	0	0	0	-1
N.S.	1	1.00	1.06	3.22	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.214	0.212	1.408	0.000	0.000	0.000	0.000	0.000

Problem 17	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	315	185	1503	247	614	114	423
N.S.	1	1.00	3.54	2.08	16.89	2.78	6.90	1.28	4.75
time (sec)	N/A	0.070	0.206	0.620	0.358	0.376	12.799	3.217	6.187

Problem 18	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	454	357	2206	476	928	238	647
N.S.	1	1.00	2.51	1.97	12.19	2.63	5.13	1.31	3.57
time (sec)	N/A	0.110	0.250	0.691	0.415	0.392	29.522	3.218	6.859

Problem 19	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	344	532	3017	769	1300	382	941
N.S.	1	1.00	1.22	1.89	10.74	2.74	4.63	1.36	3.35
time (sec)	N/A	0.151	0.580	0.790	0.560	0.440	86.470	3.986	7.993

Problem 20	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	457	457	586	20505	2577	889	2161	9900	2500
N.S.	1	1.00	1.28	44.87	5.64	1.95	4.73	21.66	5.47
time (sec)	N/A	0.313	0.411	0.714	0.358	0.614	18.009	4.139	6.580

Problem 21	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	371	371	429	12391	1747	701	1727	7803	2465
N.S.	1	1.00	1.16	33.40	4.71	1.89	4.65	21.03	6.64
time (sec)	N/A	0.243	0.220	0.689	0.361	0.494	8.477	3.744	6.045

Problem 22	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	271	271	261	6452	994	486	1158	5591	1192
N.S.	1	1.00	0.96	23.81	3.67	1.79	4.27	20.63	4.40
time (sec)	N/A	0.166	0.138	0.599	0.305	0.452	4.592	4.164	5.438

Problem 23	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	120	2666	426	302	706	3885	566
N.S.	1	1.00	0.81	17.89	2.86	2.03	4.74	26.07	3.80
time (sec)	N/A	0.066	0.041	0.545	0.287	0.428	2.417	4.343	4.797

Problem 24	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	356	356	352	3913	643	0	0	0	-1
N.S.	1	1.00	0.99	10.99	1.81	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.314	0.186	1.597	0.410	0.000	0.000	0.000	0.000

Problem 25	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	373	373	374	2022	1158	0	0	0	-1
N.S.	1	1.00	1.00	5.42	3.10	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.278	0.271	1.400	0.405	0.000	0.000	0.000	0.000

Problem 26	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	345	345	314	846	1901	0	0	0	-1
N.S.	1	1.00	0.91	2.45	5.51	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.257	0.263	1.376	0.475	0.000	0.000	0.000	0.000

Problem 27	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	308	939	0	0	0	0	-1
N.S.	1	1.00	0.99	3.03	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.282	0.293	1.339	0.000	0.000	0.000	0.000	0.000

Problem 28	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	427	185	3091	339	0	115	780
N.S.	1	1.00	4.80	2.08	34.73	3.81	0.00	1.29	8.76
time (sec)	N/A	0.069	0.334	0.658	0.514	0.427	0.000	6.384	7.156

Problem 29	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	608	357	4202	620	0	238	1053
N.S.	1	1.00	3.36	1.97	23.22	3.43	0.00	1.31	5.82
time (sec)	N/A	0.108	0.393	0.751	0.627	0.405	0.000	4.005	8.312

Problem 30	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	642	532	5508	964	0	382	1396
N.S.	1	1.00	2.28	1.89	19.60	3.43	0.00	1.36	4.97
time (sec)	N/A	0.149	0.676	0.797	0.764	0.403	0.000	3.747	9.731

Problem 31	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	354	3535	694	0	0	5565	-1
N.S.	1	1.00	1.40	14.03	2.75	0.00	0.00	22.08	-0.00
time (sec)	N/A	0.222	0.196	1.646	0.349	0.000	0.000	77.487	0.000

Problem 32	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	198	198	254	1435	425	0	0	3913	-1
N.S.	1	1.00	1.28	7.25	2.15	0.00	0.00	19.76	-0.01
time (sec)	N/A	0.165	0.127	1.435	0.352	0.000	0.000	67.514	0.000

Problem 33	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	162	380	201	0	0	2364	-1
N.S.	1	1.00	1.30	3.04	1.61	0.00	0.00	18.91	-0.01
time (sec)	N/A	0.094	0.077	1.329	0.333	0.000	0.000	49.159	0.000

Problem 34	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	95	222	0	0	0	1371	-1
N.S.	1	1.00	1.25	2.92	0.00	0.00	0.00	18.04	-0.01
time (sec)	N/A	0.148	0.024	1.325	0.000	0.000	0.000	41.916	0.000

Problem 35	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	207	123	170	56	170	112	69
N.S.	1	1.00	4.70	2.80	3.86	1.27	3.86	2.55	1.57
time (sec)	N/A	0.074	0.082	0.581	0.279	0.361	0.360	3.302	5.745

Problem 36	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	173	173	292	288	423	157	386	0	241
N.S.	1	1.00	1.69	1.66	2.45	0.91	2.23	0.00	1.39
time (sec)	N/A	0.118	0.208	0.619	0.332	0.407	0.730	0.000	5.844

Problem 37	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	418	460	883	356	889	117	545
N.S.	1	1.00	1.64	1.80	3.46	1.40	3.49	0.46	2.14
time (sec)	N/A	0.160	0.249	0.646	0.402	0.367	3.257	48.926	6.930

Problem 38	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	373	373	492	637	1456	619	1392	240	970
N.S.	1	1.00	1.32	1.71	3.90	1.66	3.73	0.64	2.60
time (sec)	N/A	0.205	0.449	0.841	0.536	0.380	12.036	62.323	9.510

Problem 39	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	341	341	359	1789	1089	0	0	3797	-1
N.S.	1	1.00	1.05	5.25	3.19	0.00	0.00	11.13	-0.00
time (sec)	N/A	0.266	0.288	1.515	0.347	0.000	0.000	79.566	0.000

Problem 40	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	260	260	239	559	725	0	0	2452	-1
N.S.	1	1.00	0.92	2.15	2.79	0.00	0.00	9.43	-0.00
time (sec)	N/A	0.201	0.164	1.380	0.378	0.000	0.000	66.133	0.000

Problem 41	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	175	395	0	0	0	1321	-1
N.S.	1	1.00	1.09	2.47	0.00	0.00	0.00	8.26	-0.01
time (sec)	N/A	0.113	0.114	1.432	0.000	0.000	0.000	59.488	0.000

Problem 42	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	104	170	110	78	231	120	106
N.S.	1	1.00	1.06	1.73	1.12	0.80	2.36	1.22	1.08
time (sec)	N/A	0.027	0.034	0.512	0.280	0.360	0.715	4.070	4.885

Problem 43	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	292	286	383	143	386	204	247
N.S.	1	1.00	1.87	1.83	2.46	0.92	2.47	1.31	1.58
time (sec)	N/A	0.110	0.192	0.647	0.303	0.366	0.685	3.886	5.813

Problem 44	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	261	261	324	455	792	322	828	111	415
N.S.	1	1.00	1.24	1.74	3.03	1.23	3.17	0.43	1.59
time (sec)	N/A	0.142	0.290	0.642	0.325	0.459	2.350	56.124	6.175

Problem 45	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	364	364	453	628	1621	650	0	239	984
N.S.	1	1.00	1.24	1.73	4.45	1.79	0.00	0.66	2.70
time (sec)	N/A	0.194	0.466	0.739	0.486	0.426	0.000	57.822	9.113

Problem 46	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	457	457	520	803	2424	1002	0	384	1679
N.S.	1	1.00	1.14	1.76	5.30	2.19	0.00	0.84	3.67
time (sec)	N/A	0.207	0.838	0.908	0.566	0.425	0.000	74.755	12.438

Problem 47	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	361	361	317	737	1797	0	0	0	-1
N.S.	1	1.00	0.88	2.04	4.98	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.252	0.295	1.456	0.467	0.000	0.000	0.000	0.000

Problem 48	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	251	251	245	606	0	0	0	0	-1
N.S.	1	1.00	0.98	2.41	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.165	0.221	1.433	0.000	0.000	0.000	0.000	0.000

Problem 49	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	207	181	522	174	382	149	198
N.S.	1	1.00	2.44	2.13	6.14	2.05	4.49	1.75	2.33
time (sec)	N/A	0.044	0.109	0.507	0.292	0.386	3.233	2.552	5.626

Problem 50	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	111	337	233	213	422	249	208
N.S.	1	1.00	0.77	2.34	1.62	1.48	2.93	1.73	1.44
time (sec)	N/A	0.079	0.082	0.480	0.283	0.372	1.291	2.813	5.433

Problem 51	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	243	243	418	462	847	350	889	332	545
N.S.	1	1.00	1.72	1.90	3.49	1.44	3.66	1.37	2.24
time (sec)	N/A	0.142	0.305	0.637	0.406	0.370	3.665	6.183	7.084

Problem 52	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	365	365	452	632	1659	676	0	0	983
N.S.	1	1.00	1.24	1.73	4.55	1.85	0.00	0.00	2.69
time (sec)	N/A	0.174	0.484	0.710	0.562	0.406	0.000	0.000	9.293

Problem 53	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	463	463	533	804	2298	1022	2106	0	1443
N.S.	1	1.00	1.15	1.74	4.96	2.21	4.55	0.00	3.12
time (sec)	N/A	0.211	0.759	0.808	0.633	0.428	144.961	0.000	12.777

Problem 54	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	563	563	637	981	3671	1517	0	0	2291
N.S.	1	1.00	1.13	1.74	6.52	2.69	0.00	0.00	4.07
time (sec)	N/A	0.259	1.111	0.969	1.113	0.444	0.000	0.000	16.594

Problem 55	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	539	539	905	0	2682	0	0	0	-1
N.S.	1	1.00	1.68	0.00	4.98	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.463	0.509	0.413	0.430	0.000	0.000	0.000	0.000

Problem 56	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	450	450	680	0	1888	0	0	0	-1
N.S.	1	1.00	1.51	0.00	4.20	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.369	0.365	0.306	0.394	0.000	0.000	0.000	0.000

Problem 57	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	343	343	869	0	1100	0	0	0	-1
N.S.	1	1.00	2.53	0.00	3.21	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.237	0.489	0.173	0.378	0.000	0.000	0.000	0.000

Problem 58	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	205	0	534	0	0	0	-1
N.S.	1	1.00	1.01	0.00	2.63	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.148	0.137	0.097	0.356	0.000	0.000	0.000	0.000

Problem 59	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	286	286	987	0	0	0	0	0	-1
N.S.	1	1.00	3.45	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.253	0.732	0.189	0.000	0.000	0.000	0.000	0.000

Problem 60	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	241	241	1407	0	0	0	0	0	-1
N.S.	1	1.00	5.84	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.231	1.295	0.213	0.000	0.000	0.000	0.000	0.000

Problem 61	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	765	355	1991	291	714	180	469
N.S.	1	1.00	5.43	2.52	14.12	2.06	5.06	1.28	3.33
time (sec)	N/A	0.088	0.585	0.592	0.466	0.379	6.528	3.052	6.183

Problem 62	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	1035	704	3286	595	1387	425	955
N.S.	1	1.00	3.61	2.45	11.45	2.07	4.83	1.48	3.33
time (sec)	N/A	0.175	0.689	0.615	0.577	0.409	13.531	2.577	7.701

Problem 63	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	445	445	1340	1058	4812	986	0	709	1870
N.S.	1	1.00	3.01	2.38	10.81	2.22	0.00	1.59	4.20
time (sec)	N/A	0.245	1.001	0.770	0.795	0.443	0.000	3.444	10.820

Problem 64	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	711	711	1559	0	4015	0	0	0	-1
N.S.	1	1.00	2.19	0.00	5.65	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.667	0.910	0.550	0.439	0.000	0.000	0.000	0.000

Problem 65	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	761	761	1194	0	2874	0	0	0	-1
N.S.	1	1.00	1.57	0.00	3.78	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.627	0.620	0.450	0.414	0.000	0.000	0.000	0.000

Problem 66	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	589	589	677	0	1736	0	0	0	-1
N.S.	1	1.00	1.15	0.00	2.95	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.415	0.391	0.288	0.385	0.000	0.000	0.000	0.000

Problem 67	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	334	334	287	0	914	0	0	0	-1
N.S.	1	1.00	0.86	0.00	2.74	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.249	0.144	0.231	0.356	0.000	0.000	0.000	0.000

Problem 68	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	535	535	1987	0	0	0	0	0	-1
N.S.	1	1.00	3.71	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.489	2.185	0.270	0.000	0.000	0.000	0.000	0.000

Problem 69	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	442	442	2652	0	0	0	0	0	-1
N.S.	1	1.00	6.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.366	4.097	0.248	0.000	0.000	0.000	0.000	0.000

Problem 70	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	387	387	3582	0	0	0	0	0	-1
N.S.	1	1.00	9.26	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.368	4.023	0.301	0.000	0.000	0.000	0.000	0.000

Problem 71	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	1355	367	5514	407	1182	180	1153
N.S.	1	1.00	9.22	2.50	37.51	2.77	8.04	1.22	7.84
time (sec)	N/A	0.118	1.226	0.705	0.826	0.372	35.426	2.904	7.413

Problem 72	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	299	299	1788	722	8013	784	2055	425	1940
N.S.	1	1.00	5.98	2.41	26.80	2.62	6.87	1.42	6.49
time (sec)	N/A	0.205	1.862	0.793	1.157	0.412	86.915	3.982	11.199

Problem 73	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	463	463	2220	1082	10862	1264	0	709	2500
N.S.	1	1.00	4.79	2.34	23.46	2.73	0.00	1.53	5.40
time (sec)	N/A	0.280	2.480	0.917	1.644	0.449	0.000	3.866	12.769

Problem 74	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1089	1089	2330	0	5522	0	0	0	-1
N.S.	1	1.00	2.14	0.00	5.07	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.000	2.114	0.427	0.513	0.000	0.000	0.000	0.000

Problem 75	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	908	908	1555	0	4053	0	0	0	-1
N.S.	1	1.00	1.71	0.00	4.46	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.845	0.894	0.526	0.478	0.000	0.000	0.000	0.000

Problem 76	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	730	730	901	0	2508	0	0	0	-1
N.S.	1	1.00	1.23	0.00	3.44	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.561	0.467	0.338	0.459	0.000	0.000	0.000	0.000

Problem 77	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	420	420	389	0	1385	0	0	0	-1
N.S.	1	1.00	0.93	0.00	3.30	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.331	0.202	0.235	0.376	0.000	0.000	0.000	0.000

Problem 78	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	712	712	3976	0	0	0	0	0	-1
N.S.	1	1.00	5.58	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.748	2.648	0.341	0.000	0.000	0.000	0.000	0.000

Problem 79	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	692	692	5108	0	0	0	0	0	-1
N.S.	1	1.00	7.38	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.515	13.068	0.335	0.000	0.000	0.000	0.000	0.000

Problem 80	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	604	604	6295	0	0	0	0	0	-1
N.S.	1	1.00	10.42	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.422	11.084	0.355	0.000	0.000	0.000	0.000	0.000

Problem 81	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	2470	367	11664	537	0	180	1565
N.S.	1	1.00	16.80	2.50	79.35	3.65	0.00	1.22	10.65
time (sec)	N/A	0.115	0.986	0.775	1.550	0.412	0.000	3.984	10.429

Problem 82	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	299	299	2289	722	15741	1007	0	425	2500
N.S.	1	1.00	7.66	2.41	52.65	3.37	0.00	1.42	8.36
time (sec)	N/A	0.200	2.896	0.936	2.265	0.431	0.000	4.342	12.639

Problem 83	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	463	463	2583	1082	20306	1568	0	709	2500
N.S.	1	1.00	5.58	2.34	43.86	3.39	0.00	1.53	5.40
time (sec)	N/A	0.274	4.469	1.037	3.052	0.439	0.000	4.158	14.174

Problem 84	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	718	718	4802	0	0	0	0	0	-1
N.S.	1	1.00	6.69	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.638	1.188	0.362	0.000	0.000	0.000	0.000	0.000

Problem 85	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	536	536	1514	0	0	0	0	0	-1
N.S.	1	1.00	2.82	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.427	1.070	0.282	0.000	0.000	0.000	0.000	0.000

Problem 86	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	283	283	646	0	0	0	0	0	-1
N.S.	1	1.00	2.28	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.224	0.434	0.168	0.000	0.000	0.000	0.000	0.000

Problem 87	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	251	464	0	0	0	0	-1
N.S.	1	1.00	1.98	3.65	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.080	0.105	1.368	0.000	0.000	0.000	0.000	0.000

Problem 88	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	79	182	395	82	206	143	96
N.S.	1	1.00	1.80	4.14	8.98	1.86	4.68	3.25	2.18
time (sec)	N/A	0.104	0.134	0.600	0.295	0.418	0.412	3.478	5.760

Problem 89	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	186	527	1020	243	541	0	419
N.S.	1	1.00	1.02	2.88	5.57	1.33	2.96	0.00	2.29
time (sec)	N/A	0.187	0.360	0.583	0.435	0.380	0.936	0.000	6.371

Problem 90	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	343	343	318	882	2118	549	1488	182	981
N.S.	1	1.00	0.93	2.57	6.17	1.60	4.34	0.53	2.86
time (sec)	N/A	0.263	0.683	0.661	0.650	0.381	5.459	63.570	8.300

Problem 91	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	507	507	442	1244	3407	951	2388	427	1882
N.S.	1	1.00	0.87	2.45	6.72	1.88	4.71	0.84	3.71
time (sec)	N/A	0.325	0.907	0.801	0.964	0.422	36.671	77.222	11.446

Problem 92	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	722	722	5193	0	0	0	0	0	-1
N.S.	1	1.00	7.19	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.479	6.929	0.314	0.000	0.000	0.000	0.000	0.000

Problem 93	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	469	469	1969	0	0	0	0	0	-1
N.S.	1	1.00	4.20	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.308	2.404	0.256	0.000	0.000	0.000	0.000	0.000

Problem 94	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	261	261	1107	0	0	0	0	0	-1
N.S.	1	1.00	4.24	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.178	1.046	0.184	0.000	0.000	0.000	0.000	0.000

Problem 95	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	315	341	366	144	432	179	222
N.S.	1	1.00	2.07	2.24	2.41	0.95	2.84	1.18	1.46
time (sec)	N/A	0.048	0.297	0.573	0.280	0.431	1.469	3.602	5.618

Problem 96	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	187	521	921	227	539	349	423
N.S.	1	1.00	0.87	2.43	4.30	1.06	2.52	1.63	1.98
time (sec)	N/A	0.165	0.387	0.669	0.356	0.402	0.943	3.711	6.275

Problem 97	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	365	365	307	872	1846	503	1404	177	731
N.S.	1	1.00	0.84	2.39	5.06	1.38	3.85	0.48	2.00
time (sec)	N/A	0.244	0.618	0.632	0.415	0.378	4.116	63.114	7.202

Problem 98	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	523	523	466	1228	3942	990	0	426	1497
N.S.	1	1.00	0.89	2.35	7.54	1.89	0.00	0.81	2.86
time (sec)	N/A	0.309	0.855	0.747	0.670	0.415	0.000	78.578	11.471

Problem 99	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	682	682	613	1588	5815	1516	0	711	2701
N.S.	1	1.00	0.90	2.33	8.53	2.22	0.00	1.04	3.96
time (sec)	N/A	0.364	1.287	0.953	0.910	0.448	0.000	93.181	13.572

Problem 100	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	635	635	6052	0	0	0	0	0	-1
N.S.	1	1.00	9.53	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.383	7.195	0.252	0.000	0.000	0.000	0.000	0.000

Problem 101	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	410	410	2950	0	0	0	0	0	-1
N.S.	1	1.00	7.20	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.272	3.018	0.246	0.000	0.000	0.000	0.000	0.000

Problem 102	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	767	361	1867	291	712	268	474
N.S.	1	1.00	5.44	2.56	13.24	2.06	5.05	1.90	3.36
time (sec)	N/A	0.075	0.580	0.549	0.492	0.382	7.387	2.329	6.404

Problem 103	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	296	296	444	688	795	366	892	487	507
N.S.	1	1.00	1.50	2.32	2.69	1.24	3.01	1.65	1.71
time (sec)	N/A	0.103	0.275	0.618	0.361	0.391	2.828	2.750	6.478

Problem 104	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	375	375	290	881	2027	543	1488	613	984
N.S.	1	1.00	0.77	2.35	5.41	1.45	3.97	1.63	2.62
time (sec)	N/A	0.276	0.620	0.698	0.637	0.418	5.366	3.122	8.104

Problem 105	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	525	525	453	1233	4045	1017	0	0	1505
N.S.	1	1.00	0.86	2.35	7.70	1.94	0.00	0.00	2.87
time (sec)	N/A	0.292	0.882	0.808	1.016	0.423	0.000	0.000	11.558

Problem 106	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	685	685	611	1589	5383	1530	0	0	2155
N.S.	1	1.00	0.89	2.32	7.86	2.23	0.00	0.00	3.15
time (sec)	N/A	0.349	1.174	0.900	1.246	0.452	0.000	0.000	14.311

Problem 107	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	851	851	793	1951	8906	2268	0	0	2500
N.S.	1	1.00	0.93	2.29	10.47	2.67	0.00	0.00	2.94
time (sec)	N/A	0.425	1.700	1.133	2.374	0.502	0.000	0.000	18.950

Problem 108	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	269	0	1109	635	0	3847	1237
N.S.	1	1.00	1.21	0.00	4.97	2.85	0.00	17.25	5.55
time (sec)	N/A	0.132	0.175	0.094	0.315	0.496	0.000	3.505	5.620

Problem 109	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	225	0	733	467	0	2522	663
N.S.	1	1.00	1.18	0.00	3.86	2.46	0.00	13.27	3.49
time (sec)	N/A	0.109	0.125	0.117	0.287	0.431	0.000	4.674	5.024

Problem 110	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	189	0	388	281	0	1277	295
N.S.	1	1.00	1.27	0.00	2.60	1.89	0.00	8.57	1.98
time (sec)	N/A	0.076	0.191	0.069	0.283	0.407	0.000	2.695	4.839

Problem 111	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	74	0	155	152	382	561	134
N.S.	1	1.00	0.86	0.00	1.80	1.77	4.44	6.52	1.56
time (sec)	N/A	0.041	0.028	0.087	0.266	0.376	159.150	2.524	4.339

Problem 112	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	172	0	262	0	0	0	-1
N.S.	1	1.00	1.22	0.00	1.86	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.203	0.087	0.204	0.528	0.000	0.000	0.000	0.000

Problem 113	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	189	0	0	0	0	0	-1
N.S.	1	1.00	1.26	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.141	0.121	0.111	0.000	0.000	0.000	0.000	0.000

Problem 114	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	216	0	578	223	0	95	204
N.S.	1	1.00	2.43	0.00	6.49	2.51	0.00	1.07	2.29
time (sec)	N/A	0.053	0.112	0.116	0.294	0.429	0.000	3.347	5.253

Problem 115	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	196	0	941	435	0	234	374
N.S.	1	1.00	1.08	0.00	5.20	2.40	0.00	1.29	2.07
time (sec)	N/A	0.093	0.295	0.113	0.319	0.398	0.000	4.918	5.276

Problem 116	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	220	0	1394	709	0	388	610
N.S.	1	1.00	0.78	0.00	4.96	2.52	0.00	1.38	2.17
time (sec)	N/A	0.131	0.344	0.118	0.341	0.395	0.000	3.406	5.869

Problem 117	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	442	442	441	0	1889	837	0	4589	2555
N.S.	1	1.00	1.00	0.00	4.27	1.89	0.00	10.38	5.78
time (sec)	N/A	0.301	0.265	0.151	0.319	0.560	0.000	5.188	5.915

Problem 118	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	352	352	374	0	1269	596	0	2995	1328
N.S.	1	1.00	1.06	0.00	3.61	1.69	0.00	8.51	3.77
time (sec)	N/A	0.234	0.190	0.193	0.296	0.415	0.000	4.331	5.138

Problem 119	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	224	0	696	411	0	1757	661
N.S.	1	1.00	0.90	0.00	2.78	1.64	0.00	7.03	2.64
time (sec)	N/A	0.150	0.140	0.106	0.292	0.457	0.000	4.439	5.149

Problem 120	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	101	0	289	232	0	860	303
N.S.	1	1.00	0.81	0.00	2.33	1.87	0.00	6.94	2.44
time (sec)	N/A	0.052	0.037	0.107	0.272	0.422	0.000	3.109	4.625

Problem 121	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	289	289	264	0	463	0	0	0	-1
N.S.	1	1.00	0.91	0.00	1.60	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.249	0.132	0.171	0.543	0.000	0.000	0.000	0.000

Problem 122	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	259	259	233	0	966	0	0	0	-1
N.S.	1	1.00	0.90	0.00	3.73	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.225	0.160	0.177	0.536	0.000	0.000	0.000	0.000

Problem 123	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	258	0	0	0	0	0	-1
N.S.	1	1.00	1.07	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.219	0.228	0.157	0.000	0.000	0.000	0.000	0.000

Problem 124	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	329	0	1520	304	0	94	421
N.S.	1	1.00	3.54	0.00	16.34	3.27	0.00	1.01	4.53
time (sec)	N/A	0.070	0.221	0.135	0.351	0.411	0.000	5.106	5.622

Problem 125	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	474	0	2223	567	0	222	652
N.S.	1	1.00	2.51	0.00	11.76	3.00	0.00	1.17	3.45
time (sec)	N/A	0.108	0.274	0.182	0.438	0.395	0.000	6.676	6.075

Problem 126	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	357	0	3034	894	0	376	954
N.S.	1	1.00	1.22	0.00	10.35	3.05	0.00	1.28	3.26
time (sec)	N/A	0.150	0.653	0.171	0.501	0.414	0.000	8.140	6.708

Problem 127	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	477	477	631	0	2780	1118	0	5436	2500
N.S.	1	1.00	1.32	0.00	5.83	2.34	0.00	11.40	5.24
time (sec)	N/A	0.310	0.403	0.158	0.344	0.678	0.000	5.806	6.558

Problem 128	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	387	387	441	0	1890	894	0	3942	2547
N.S.	1	1.00	1.14	0.00	4.88	2.31	0.00	10.19	6.58
time (sec)	N/A	0.252	0.242	0.190	0.325	0.579	0.000	6.483	6.256

Problem 129	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	283	283	269	0	1061	603	0	2372	1234
N.S.	1	1.00	0.95	0.00	3.75	2.13	0.00	8.38	4.36
time (sec)	N/A	0.169	0.155	0.119	0.310	0.504	0.000	4.087	5.401

Problem 130	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	124	0	452	355	0	1249	588
N.S.	1	1.00	0.79	0.00	2.90	2.28	0.00	8.01	3.77
time (sec)	N/A	0.069	0.046	0.116	0.274	0.398	0.000	4.289	4.976

Problem 131	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	373	373	368	0	757	0	0	0	-1
N.S.	1	1.00	0.99	0.00	2.03	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.335	0.191	0.134	0.581	0.000	0.000	0.000	0.000

Problem 132	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	390	390	394	0	1458	0	0	0	-1
N.S.	1	1.00	1.01	0.00	3.74	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.290	0.277	0.167	0.617	0.000	0.000	0.000	0.000

Problem 133	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	361	361	331	0	2336	0	0	0	-1
N.S.	1	1.00	0.92	0.00	6.47	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.266	0.280	0.193	0.716	0.000	0.000	0.000	0.000

Problem 134	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	326	326	326	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.285	0.313	0.168	0.000	0.000	0.000	0.000	0.000

Problem 135	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	370	0	937	0	0	3849	-1
N.S.	1	1.00	1.38	0.00	3.48	0.00	0.00	14.31	-0.00
time (sec)	N/A	0.239	0.198	0.188	0.563	0.000	0.000	188.803	0.000

Problem 136	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	266	0	590	0	0	2524	-1
N.S.	1	1.00	1.26	0.00	2.80	0.00	0.00	11.96	-0.00
time (sec)	N/A	0.175	0.126	0.148	0.559	0.000	0.000	123.828	0.000

Problem 137	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	170	0	289	0	0	1279	-1
N.S.	1	1.00	1.27	0.00	2.16	0.00	0.00	9.54	-0.01
time (sec)	N/A	0.099	0.082	0.200	0.564	0.000	0.000	75.172	0.000

Problem 138	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	101	0	0	0	0	563	-1
N.S.	1	1.00	1.26	0.00	0.00	0.00	0.00	7.04	-0.01
time (sec)	N/A	0.153	0.023	0.196	0.000	0.000	0.000	52.907	0.000

Problem 139	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	219	0	172	59	0	88	76
N.S.	1	1.00	4.38	0.00	3.44	1.18	0.00	1.76	1.52
time (sec)	N/A	0.079	0.079	0.147	0.279	0.389	0.000	2.581	5.720

Problem 140	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	304	0	425	183	0	0	239
N.S.	1	1.00	1.68	0.00	2.35	1.01	0.00	0.00	1.32
time (sec)	N/A	0.121	0.196	0.188	0.309	0.417	0.000	0.000	6.080

Problem 141	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	266	266	434	0	885	441	0	97	573
N.S.	1	1.00	1.63	0.00	3.33	1.66	0.00	0.36	2.15
time (sec)	N/A	0.161	0.248	0.191	0.382	0.395	0.000	98.714	6.337

Problem 142	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	389	389	518	0	1458	773	0	236	986
N.S.	1	1.00	1.33	0.00	3.75	1.99	0.00	0.61	2.53
time (sec)	N/A	0.201	0.464	0.177	0.518	0.438	0.000	139.654	7.235

Problem 143	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	359	359	375	0	1721	0	0	2988	-1
N.S.	1	1.00	1.04	0.00	4.79	0.00	0.00	8.32	-0.00
time (sec)	N/A	0.283	0.302	0.149	0.566	0.000	0.000	269.837	0.000

Problem 144	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	275	275	252	0	1163	0	0	1838	-1
N.S.	1	1.00	0.92	0.00	4.23	0.00	0.00	6.68	-0.00
time (sec)	N/A	0.213	0.170	0.199	0.549	0.000	0.000	196.843	0.000

Problem 145	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	168	168	183	0	0	0	0	866	-1
N.S.	1	1.00	1.09	0.00	0.00	0.00	0.00	5.15	-0.01
time (sec)	N/A	0.115	0.122	0.107	0.000	0.000	0.000	126.448	0.000

Problem 146	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	114	0	112	87	0	84	113
N.S.	1	1.00	1.12	0.00	1.10	0.85	0.00	0.82	1.11
time (sec)	N/A	0.031	0.037	0.103	0.263	0.393	0.000	3.471	4.836

Problem 147	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	304	0	385	159	0	180	241
N.S.	1	1.00	1.83	0.00	2.32	0.96	0.00	1.08	1.45
time (sec)	N/A	0.118	0.213	0.187	0.293	0.386	0.000	4.067	4.816

Problem 148	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	273	273	342	0	794	365	0	86	432
N.S.	1	1.00	1.25	0.00	2.91	1.34	0.00	0.32	1.58
time (sec)	N/A	0.151	0.304	0.170	0.324	0.387	0.000	95.650	5.461

Problem 149	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	380	380	478	0	1623	776	0	222	1016
N.S.	1	1.00	1.26	0.00	4.27	2.04	0.00	0.58	2.67
time (sec)	N/A	0.197	0.491	0.207	0.420	0.412	0.000	124.707	7.381

Problem 150	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	477	477	549	0	2426	1200	0	377	1665
N.S.	1	1.00	1.15	0.00	5.09	2.52	0.00	0.79	3.49
time (sec)	N/A	0.205	0.902	0.203	0.521	0.405	0.000	176.548	9.933

Problem 151	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	382	382	334	0	2731	0	0	0	-1
N.S.	1	1.00	0.87	0.00	7.15	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.277	0.295	0.139	0.742	0.000	0.000	0.000	0.000

Problem 152	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	259	0	0	0	0	0	-1
N.S.	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.178	0.233	0.175	0.000	0.000	0.000	0.000	0.000

Problem 153	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	215	0	530	220	0	93	205
N.S.	1	1.00	2.42	0.00	5.96	2.47	0.00	1.04	2.30
time (sec)	N/A	0.046	0.110	0.102	0.312	0.424	0.000	3.633	5.493

Problem 154	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	115	0	235	248	0	181	221
N.S.	1	1.00	0.76	0.00	1.56	1.64	0.00	1.20	1.46
time (sec)	N/A	0.085	0.094	0.107	0.273	0.401	0.000	2.580	4.965

Problem 155	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	254	254	434	0	849	435	0	362	573
N.S.	1	1.00	1.71	0.00	3.34	1.71	0.00	1.43	2.26
time (sec)	N/A	0.146	0.248	0.205	0.386	0.377	0.000	3.795	6.652

Problem 156	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	381	381	477	0	1661	845	0	0	1018
N.S.	1	1.00	1.25	0.00	4.36	2.22	0.00	0.00	2.67
time (sec)	N/A	0.175	0.495	0.153	0.547	0.479	0.000	0.000	7.534

Problem 157	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	483	483	561	0	2300	1265	0	0	1341
N.S.	1	1.00	1.16	0.00	4.76	2.62	0.00	0.00	2.78
time (sec)	N/A	0.215	0.812	0.196	0.550	0.410	0.000	0.000	7.930

Problem 158	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	587	587	671	0	3673	1922	0	0	2400
N.S.	1	1.00	1.14	0.00	6.26	3.27	0.00	0.00	4.09
time (sec)	N/A	0.261	1.195	0.203	1.106	0.599	0.000	0.000	10.216

Problem 159	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	584	584	949	0	3392	0	0	0	-1
N.S.	1	1.00	1.62	0.00	5.81	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.499	0.528	0.190	0.856	0.000	0.000	0.000	0.000

Problem 160	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	487	487	716	0	2425	0	0	0	-1
N.S.	1	1.00	1.47	0.00	4.98	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.400	0.396	0.183	0.835	0.000	0.000	0.000	0.000

Problem 161	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	372	372	937	0	1419	0	0	0	-1
N.S.	1	1.00	2.52	0.00	3.81	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.255	0.498	0.083	0.840	0.000	0.000	0.000	0.000

Problem 162	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	216	0	768	0	0	0	-1
N.S.	1	1.00	0.98	0.00	3.49	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.157	0.140	0.066	0.794	0.000	0.000	0.000	0.000

Problem 163	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	306	306	742	0	0	0	0	0	-1
N.S.	1	1.00	2.42	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.265	1.173	0.107	0.000	0.000	0.000	0.000	0.000

Problem 164	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	261	261	1556	0	0	0	0	0	-1
N.S.	1	1.00	5.96	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.243	1.922	0.109	0.000	0.000	0.000	0.000	0.000

Problem 165	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	801	0	2013	478	0	177	561
N.S.	1	1.00	5.30	0.00	13.33	3.17	0.00	1.17	3.72
time (sec)	N/A	0.092	0.601	0.111	0.414	0.367	0.000	6.454	6.821

Problem 166	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	307	307	1079	0	3308	948	0	491	993
N.S.	1	1.00	3.51	0.00	10.78	3.09	0.00	1.60	3.23
time (sec)	N/A	0.185	0.733	0.110	0.542	0.515	0.000	6.959	7.857

Problem 167	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	475	475	1392	0	4834	1529	0	841	1794
N.S.	1	1.00	2.93	0.00	10.18	3.22	0.00	1.77	3.78
time (sec)	N/A	0.259	0.886	0.113	0.726	0.556	0.000	7.547	9.741

Problem 168	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	766	766	1634	0	4882	0	0	0	-1
N.S.	1	1.00	2.13	0.00	6.37	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.715	0.956	0.320	0.848	0.000	0.000	0.000	0.000

Problem 169	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	819	819	1254	0	3499	0	0	0	-1
N.S.	1	1.00	1.53	0.00	4.27	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.667	0.656	0.265	0.806	0.000	0.000	0.000	0.000

Problem 170	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	635	635	713	0	2166	0	0	0	-1
N.S.	1	1.00	1.12	0.00	3.41	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.442	0.421	0.133	0.804	0.000	0.000	0.000	0.000

Problem 171	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	361	361	303	0	1207	0	0	0	-1
N.S.	1	1.00	0.84	0.00	3.34	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.254	0.161	0.121	0.742	0.000	0.000	0.000	0.000

Problem 172	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	572	572	1659	0	0	0	0	0	-1
N.S.	1	1.00	2.90	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.518	1.972	0.184	0.000	0.000	0.000	0.000	0.000

Problem 173	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	472	472	2834	0	0	0	0	0	-1
N.S.	1	1.00	6.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.374	8.400	0.160	0.000	0.000	0.000	0.000	0.000

Problem 174	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	417	417	4766	0	0	0	0	0	-1
N.S.	1	1.00	11.43	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.371	10.857	0.211	0.000	0.000	0.000	0.000	0.000

Problem 175	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	1415	0	5552	646	0	176	1195
N.S.	1	1.00	9.01	0.00	35.36	4.11	0.00	1.12	7.61
time (sec)	N/A	0.119	1.443	0.144	0.750	0.396	0.000	9.953	7.477

Problem 176	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	319	319	1860	0	8051	1219	0	461	1934
N.S.	1	1.00	5.83	0.00	25.24	3.82	0.00	1.45	6.06
time (sec)	N/A	0.211	1.848	0.201	1.059	0.449	0.000	10.645	9.424

Problem 177	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	493	493	2320	0	10900	1902	0	811	2500
N.S.	1	1.00	4.71	0.00	22.11	3.86	0.00	1.65	5.07
time (sec)	N/A	0.296	2.388	0.204	1.430	0.452	0.000	13.694	11.154

Problem 178	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1172	1172	2448	0	6587	0	0	0	-1
N.S.	1	1.00	2.09	0.00	5.62	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.051	2.205	0.367	1.020	0.000	0.000	0.000	0.000

Problem 179	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	976	976	1627	0	4917	0	0	0	-1
N.S.	1	1.00	1.67	0.00	5.04	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.904	0.928	0.274	0.896	0.000	0.000	0.000	0.000

Problem 180	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	786	786	945	0	3094	0	0	0	-1
N.S.	1	1.00	1.20	0.00	3.94	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.588	0.499	0.191	0.854	0.000	0.000	0.000	0.000

Problem 181	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	454	454	409	0	1764	0	0	0	-1
N.S.	1	1.00	0.90	0.00	3.89	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.358	0.223	0.159	0.779	0.000	0.000	0.000	0.000

Problem 182	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	762	762	2949	0	0	0	0	0	-1
N.S.	1	1.00	3.87	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.766	3.166	0.172	0.000	0.000	0.000	0.000	0.000

Problem 183	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	739	739	4150	0	0	0	0	0	-1
N.S.	1	1.00	5.62	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.540	16.518	0.180	0.000	0.000	0.000	0.000	0.000

Problem 184	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	644	644	6226	0	0	0	0	0	-1
N.S.	1	1.00	9.67	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.448	21.168	0.166	0.000	0.000	0.000	0.000	0.000

Problem 185	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	561	561	8775	0	0	0	0	0	-1
N.S.	1	1.00	15.64	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.496	7.400	0.203	0.000	0.000	0.000	0.000	0.000

Problem 186	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	768	768	3265	0	0	0	0	0	-1
N.S.	1	1.00	4.25	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.658	2.771	0.162	0.000	0.000	0.000	0.000	0.000

Problem 187	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	573	573	1741	0	0	0	0	0	-1
N.S.	1	1.00	3.04	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.448	1.019	0.140	0.000	0.000	0.000	0.000	0.000

Problem 188	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	303	303	802	0	0	0	0	0	-1
N.S.	1	1.00	2.65	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.233	0.393	0.080	0.000	0.000	0.000	0.000	0.000

Problem 189	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	306	0	0	0	0	0	-1
N.S.	1	1.00	2.23	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.085	0.118	0.093	0.000	0.000	0.000	0.000	0.000

Problem 190	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	90	0	403	100	0	157	122
N.S.	1	1.00	1.80	0.00	8.06	2.00	0.00	3.14	2.44
time (sec)	N/A	0.110	0.136	0.207	0.302	0.365	0.000	4.288	5.680

Problem 191	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	199	793	0	1028	366	0	0	361
N.S.	1	1.00	3.98	0.00	5.17	1.84	0.00	0.00	1.81
time (sec)	N/A	0.199	0.447	0.190	0.446	0.404	0.000	0.000	5.852

Problem 192	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	369	369	975	0	2126	879	0	179	1011
N.S.	1	1.00	2.64	0.00	5.76	2.38	0.00	0.49	2.74
time (sec)	N/A	0.279	0.797	0.182	0.664	0.420	0.000	264.583	8.489

Problem 193	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	543	543	1295	0	3415	1548	0	0	1921
N.S.	1	1.00	2.38	0.00	6.29	2.85	0.00	0.00	3.54
time (sec)	N/A	0.347	1.120	0.158	0.970	0.492	0.000	0.000	10.342

Problem 194	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	770	770	3540	0	0	0	0	0	-1
N.S.	1	1.00	4.60	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.503	6.020	0.190	0.000	0.000	0.000	0.000	0.000

Problem 195	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	500	500	2196	0	0	0	0	0	-1
N.S.	1	1.00	4.39	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.337	3.004	0.167	0.000	0.000	0.000	0.000	0.000

Problem 196	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	1261	0	0	0	0	0	-1
N.S.	1	1.00	4.47	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.191	1.206	0.115	0.000	0.000	0.000	0.000	0.000

Problem 197	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	331	0	376	206	0	156	237
N.S.	1	1.00	2.03	0.00	2.31	1.26	0.00	0.96	1.45
time (sec)	N/A	0.055	0.294	0.103	0.311	0.373	0.000	4.632	6.268

Problem 198	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	231	789	0	928	326	0	314	365
N.S.	1	1.00	3.42	0.00	4.02	1.41	0.00	1.36	1.58
time (sec)	N/A	0.171	0.523	0.184	0.358	0.458	0.000	4.732	5.798

Problem 199	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	392	392	870	0	1854	740	0	164	-1
N.S.	1	1.00	2.22	0.00	4.73	1.89	0.00	0.42	-0.00
time (sec)	N/A	0.258	0.789	0.203	0.428	0.412	0.000	257.140	0.000

Problem 200	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	560	560	1340	0	3950	1520	0	0	1784
N.S.	1	1.00	2.39	0.00	7.05	2.71	0.00	0.00	3.19
time (sec)	N/A	0.328	1.171	0.193	0.719	0.488	0.000	0.000	10.278

Problem 201	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	729	729	1695	0	5823	2351	0	0	3157
N.S.	1	1.00	2.33	0.00	7.99	3.22	0.00	0.00	4.33
time (sec)	N/A	0.396	1.813	0.172	0.924	0.455	0.000	0.000	11.670

Problem 202	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	676	676	4669	0	0	0	0	0	-1
N.S.	1	1.00	6.91	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.405	7.615	0.172	0.000	0.000	0.000	0.000	0.000

Problem 203	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	441	441	3172	0	0	0	0	0	-1
N.S.	1	1.00	7.19	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.286	3.888	0.198	0.000	0.000	0.000	0.000	0.000

Problem 204	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	803	0	1891	483	0	178	565
N.S.	1	1.00	5.32	0.00	12.52	3.20	0.00	1.18	3.74
time (sec)	N/A	0.080	0.672	0.085	0.523	0.375	0.000	5.537	7.496

Problem 205	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	317	317	464	0	805	560	0	355	505
N.S.	1	1.00	1.46	0.00	2.54	1.77	0.00	1.12	1.59
time (sec)	N/A	0.115	0.274	0.084	0.361	0.397	0.000	6.404	6.670

Problem 206	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	402	402	971	0	2035	873	0	647	1007
N.S.	1	1.00	2.42	0.00	5.06	2.17	0.00	1.61	2.50
time (sec)	N/A	0.306	0.751	0.186	0.684	0.453	0.000	3.736	8.731

Problem 207	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	562	562	1334	0	4053	1656	0	0	1785
N.S.	1	1.00	2.37	0.00	7.21	2.95	0.00	0.00	3.18
time (sec)	N/A	0.316	1.204	0.193	1.005	0.454	0.000	0.000	10.139

Problem 208	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	732	732	1653	0	5391	2457	0	0	2419
N.S.	1	1.00	2.26	0.00	7.36	3.36	0.00	0.00	3.30
time (sec)	N/A	0.382	1.526	0.195	1.214	0.471	0.000	0.000	11.667

Problem 209	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	908	908	2138	0	8914	3747	0	0	2500
N.S.	1	1.00	2.35	0.00	9.82	4.13	0.00	0.00	2.75
time (sec)	N/A	0.455	2.497	0.183	2.284	0.505	0.000	0.000	13.701

Problem 210	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.206	0.354	0.311	0.000	0.000	0.000	0.000	0.000

Problem 211	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.203	0.339	0.276	0.000	0.000	0.000	0.000	0.000

Problem 212	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	292	292	206	0	0	2063	0	0	-1
N.S.	1	1.00	0.71	0.00	0.00	7.07	0.00	0.00	-0.00
time (sec)	N/A	0.216	4.258	0.190	0.000	0.491	0.000	0.000	0.000

Problem 213	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	134	0	0	799	0	0	-1
N.S.	1	1.00	0.64	0.00	0.00	3.80	0.00	0.00	-0.00
time (sec)	N/A	0.168	1.321	0.213	0.000	0.399	0.000	0.000	0.000

Problem 214	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	78	0	0	235	0	0	-1
N.S.	1	1.00	0.61	0.00	0.00	1.84	0.00	0.00	-0.01
time (sec)	N/A	0.106	0.340	0.204	0.000	0.410	0.000	0.000	0.000

Problem 215	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F(-2)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	0	0	0	83	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.66	0.00	0.00	-0.01
time (sec)	N/A	0.195	0.176	0.186	0.000	0.388	0.000	0.000	0.000

Problem 216	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F(-2)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	0	0	0	240	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	1.17	0.00	0.00	-0.00
time (sec)	N/A	0.221	0.200	0.046	0.000	0.404	0.000	0.000	0.000

Problem 217	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	295	295	0	0	0	596	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	2.02	0.00	0.00	-0.00
time (sec)	N/A	0.263	0.227	0.044	0.000	0.399	0.000	0.000	0.000

Problem 218	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	309	309	206	0	0	2059	0	0	-1
N.S.	1	1.00	0.67	0.00	0.00	6.66	0.00	0.00	-0.00
time (sec)	N/A	0.216	4.385	0.238	0.000	0.431	0.000	0.000	0.000

Problem 219	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	134	0	0	802	0	0	-1
N.S.	1	1.00	0.60	0.00	0.00	3.60	0.00	0.00	-0.00
time (sec)	N/A	0.174	1.313	0.225	0.000	0.407	0.000	0.000	0.000

Problem 220	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	78	0	0	238	0	0	-1
N.S.	1	1.00	0.57	0.00	0.00	1.74	0.00	0.00	-0.01
time (sec)	N/A	0.112	0.331	0.240	0.000	0.399	0.000	0.000	0.000

Problem 221	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F(-2)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	0	0	0	90	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.70	0.00	0.00	-0.01
time (sec)	N/A	0.188	0.165	0.254	0.000	0.423	0.000	0.000	0.000

Problem 222	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F(-2)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	0	0	0	253	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	1.18	0.00	0.00	-0.00
time (sec)	N/A	0.225	0.179	0.046	0.000	0.418	0.000	0.000	0.000

Problem 223	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	306	306	0	0	0	612	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	2.00	0.00	0.00	-0.00
time (sec)	N/A	0.265	0.222	0.046	0.000	0.446	0.000	0.000	0.000

Problem 224	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	40	0	0	63	0	40	-1
N.S.	1	1.00	0.98	0.00	0.00	1.54	0.00	0.98	-0.02
time (sec)	N/A	0.082	0.020	0.215	0.000	0.398	0.000	3.377	0.000

Problem 225	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	40	0	0	63	0	40	-1
N.S.	1	1.00	0.98	0.00	0.00	1.54	0.00	0.98	-0.02
time (sec)	N/A	0.107	0.010	0.488	0.000	0.448	0.000	4.675	0.000

Problem 226	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.310	0.300	1.334	0.000	0.000	0.000	0.000	0.000

Problem 227	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	194	194	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.305	0.266	1.441	0.000	0.000	0.000	0.000	0.000

Problem 228	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	43	64288	761	306	0	0	141
N.S.	1	1.00	0.96	1428.62	16.91	6.80	0.00	0.00	3.13
time (sec)	N/A	0.139	0.015	25.059	0.337	0.382	0.000	0.000	5.747

Problem 229	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	43	11062	389	164	0	0	100
N.S.	1	1.00	0.96	245.82	8.64	3.64	0.00	0.00	2.22
time (sec)	N/A	0.139	0.014	2.844	0.310	0.373	0.000	0.000	4.773

Problem 230	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	A	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	43	1152	154	66	0	0	71
N.S.	1	1.00	0.96	25.60	3.42	1.47	0.00	0.00	1.58
time (sec)	N/A	0.096	0.010	0.653	0.275	0.389	0.000	0.000	4.669

Problem 231	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	39	368	46	43	0	38	40
N.S.	1	1.00	0.95	8.98	1.12	1.05	0.00	0.93	0.98
time (sec)	N/A	0.159	0.037	0.362	0.379	0.363	0.000	4.833	4.657

Problem 232	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	41	366	77	78	0	95	42
N.S.	1	1.00	0.95	8.51	1.79	1.81	0.00	2.21	0.98
time (sec)	N/A	0.154	0.017	0.378	0.403	0.396	0.000	4.287	4.492

Problem 233	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	43	366	200	197	0	301	72
N.S.	1	1.00	0.96	8.13	4.44	4.38	0.00	6.69	1.60
time (sec)	N/A	0.152	0.017	0.341	0.429	0.337	0.000	3.697	4.543

Problem 234	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	47	0	0	75	0	46	-1
N.S.	1	1.00	0.96	0.00	0.00	1.53	0.00	0.94	-0.02
time (sec)	N/A	0.189	0.021	0.203	0.000	0.393	0.000	4.475	0.000

Problem 235	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	51	0	0	79	0	50	-1
N.S.	1	1.00	0.93	0.00	0.00	1.44	0.00	0.91	-0.02
time (sec)	N/A	0.244	0.035	0.265	0.000	0.361	0.000	4.348	0.000

Problem 236	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	50	0	0	77	0	48	-1
N.S.	1	1.00	0.96	0.00	0.00	1.48	0.00	0.92	-0.02
time (sec)	N/A	0.183	0.011	0.435	0.000	0.380	0.000	4.521	0.000

Problem 237	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	39	368	46	43	0	38	40
N.S.	1	1.00	0.95	8.98	1.12	1.05	0.00	0.93	0.98
time (sec)	N/A	0.157	0.020	0.265	0.384	0.377	0.000	3.448	0.002

Problem 238	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	43	374	50	49	0	42	44
N.S.	1	1.00	0.91	7.96	1.06	1.04	0.00	0.89	0.94
time (sec)	N/A	0.210	0.053	0.313	0.378	0.372	0.000	4.339	4.429

Problem 239	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	42	371	48	46	0	40	42
N.S.	1	1.00	0.95	8.43	1.09	1.05	0.00	0.91	0.95
time (sec)	N/A	0.168	0.024	0.714	0.402	0.347	0.000	4.199	4.514

Problem 240	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.171	0.258	0.269	0.000	0.000	0.000	0.000	0.000

Problem 241	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	106	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	1.41	0.00	0.00	-0.01
time (sec)	N/A	0.072	0.021	0.234	0.000	0.347	0.000	0.000	0.000

Problem 242	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	84	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	1.12	0.00	0.00	-0.01
time (sec)	N/A	0.074	0.019	0.180	0.000	0.359	0.000	0.000	0.000

Problem 243	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	62	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.83	0.00	0.00	-0.01
time (sec)	N/A	0.053	0.016	0.136	0.000	0.384	0.000	0.000	0.000

Problem 244	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	72	0	0	38	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.53	0.00	0.00	-0.01
time (sec)	N/A	0.037	0.054	0.133	0.000	0.351	0.000	0.000	0.000

Problem 245	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	34	0	34	33	0	82	33
N.S.	1	1.00	1.03	0.00	1.03	1.00	0.00	2.48	1.00
time (sec)	N/A	0.065	0.028	0.202	0.436	0.407	0.000	4.154	4.477

Problem 246	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	71	0	0	38	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.54	0.00	0.00	-0.01
time (sec)	N/A	0.044	0.054	0.143	0.000	0.355	0.000	0.000	0.000

Problem 247	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	62	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.83	0.00	0.00	-0.01
time (sec)	N/A	0.058	0.013	0.118	0.000	0.398	0.000	0.000	0.000

Problem 248	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	84	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	1.12	0.00	0.00	-0.01
time (sec)	N/A	0.072	0.015	0.237	0.000	0.379	0.000	0.000	0.000

Problem 249	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	361	361	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.437	2.340	0.205	0.000	0.000	0.000	0.000	0.000

Problem 250	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.356	1.312	0.251	0.000	0.000	0.000	0.000	0.000

Problem 251	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	1415	0	0	0	0	0	-1
N.S.	1	1.00	6.97	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.303	0.489	0.228	0.000	0.000	0.000	0.000	0.000

Problem 252	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	304	1447	0	0	0	0	-1
N.S.	1	1.00	2.47	11.76	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.185	0.102	0.429	0.000	0.000	0.000	0.000	0.000

Problem 253	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	82	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.165	0.082	0.219	0.000	0.000	0.000	0.000	0.000

Problem 254	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	82	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.155	0.208	0.010	0.000	0.000	0.000	0.000	0.000

Problem 255	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	298	42	357	32	0	0	-1
N.S.	1	1.00	9.03	1.27	10.82	0.97	0.00	0.00	-0.03
time (sec)	N/A	0.071	0.132	0.970	0.306	0.417	0.000	0.000	0.000

Problem 256	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	320	45	344	38	0	0	-1
N.S.	1	1.00	11.85	1.67	12.74	1.41	0.00	0.00	-0.04
time (sec)	N/A	0.049	0.181	0.858	0.303	0.386	0.000	0.000	0.000

Problem 257	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	320	45	336	38	0	0	-1
N.S.	1	1.00	11.85	1.67	12.44	1.41	0.00	0.00	-0.04
time (sec)	N/A	0.083	0.130	0.746	0.288	0.360	0.000	0.000	0.000

Problem 258	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	320	45	343	38	0	0	-1
N.S.	1	1.00	11.85	1.67	12.70	1.41	0.00	0.00	-0.04
time (sec)	N/A	0.085	0.126	0.741	0.305	0.395	0.000	0.000	0.000

Problem 259	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.421	1.037	0.529	0.000	0.000	0.000	0.000	0.000

Problem 260	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	1415	0	0	0	0	0	-1
N.S.	1	1.00	6.97	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.343	0.404	0.553	0.000	0.000	0.000	0.000	0.000

Problem 261	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	303	1447	0	0	0	0	-1
N.S.	1	1.00	2.46	11.76	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.201	0.087	0.718	0.000	0.000	0.000	0.000	0.000

Problem 262	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	83	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.191	0.069	0.474	0.000	0.000	0.000	0.000	0.000

Problem 263	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	83	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.171	0.164	0.011	0.000	0.000	0.000	0.000	0.000

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [259] had the largest ratio of [51]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	5	4	1.00	38	0.105
2	A	5	4	1.00	38	0.105
3	A	5	4	1.00	36	0.111
4	A	4	3	1.00	28	0.107
5	A	6	6	1.00	38	0.158
6	A	5	5	1.00	38	0.132
7	A	2	2	1.00	38	0.053
8	A	5	4	1.00	38	0.105
9	A	5	5	1.00	38	0.132
10	A	5	5	1.00	40	0.125
11	A	5	5	1.00	40	0.125
12	A	5	5	1.00	38	0.132
13	A	4	3	1.00	30	0.100
14	A	10	8	1.00	40	0.200
15	A	8	8	1.00	40	0.200
16	A	7	5	1.00	40	0.125
17	A	2	2	1.00	40	0.050
18	A	5	4	1.00	40	0.100
19	A	5	5	1.00	40	0.125
20	A	5	5	1.00	40	0.125
21	A	5	5	1.00	40	0.125
22	A	5	5	1.00	38	0.132
23	A	4	3	1.00	30	0.100
24	A	14	8	1.00	40	0.200
25	A	11	9	1.00	40	0.225

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
26	A	9	8	1.00	40	0.200
27	A	9	5	1.00	40	0.125
28	A	2	2	1.00	40	0.050
29	A	5	4	1.00	40	0.100
30	A	5	5	1.00	40	0.125
31	A	6	4	1.00	40	0.100
32	A	5	4	1.00	40	0.100
33	A	4	4	1.00	38	0.105
34	A	5	5	1.00	30	0.167
35	A	2	2	1.00	40	0.050
36	A	5	5	1.00	40	0.125
37	A	7	7	1.00	40	0.175
38	A	8	6	1.00	40	0.150
39	A	9	7	1.00	40	0.175
40	A	8	7	1.00	40	0.175
41	A	7	6	1.00	38	0.158
42	A	3	2	1.00	30	0.067
43	A	5	4	1.00	40	0.100
44	A	4	4	1.00	40	0.100
45	A	8	6	1.00	40	0.150
46	A	4	4	1.00	40	0.100
47	A	9	8	1.00	40	0.200
48	A	8	7	1.00	40	0.175
49	A	2	2	1.00	38	0.053
50	A	4	3	1.00	30	0.100
51	A	4	4	1.00	40	0.100
52	A	4	4	1.00	40	0.100
53	A	5	4	1.00	40	0.100
54	A	8	6	1.00	40	0.150
55	A	11	8	1.00	40	0.200
56	A	10	8	1.00	40	0.200
57	A	9	8	1.00	38	0.210
58	A	7	7	1.00	30	0.233
59	A	8	8	1.00	40	0.200
60	A	7	7	1.00	40	0.175

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
61	A	3	3	1.00	40	0.075
62	A	7	4	1.00	40	0.100
63	A	9	4	1.00	40	0.100
64	A	17	13	1.00	42	0.310
65	A	15	11	1.00	42	0.262
66	A	14	11	1.00	40	0.275
67	A	11	8	1.00	32	0.250
68	A	15	11	1.00	42	0.262
69	A	11	10	1.00	42	0.238
70	A	10	7	1.00	42	0.167
71	A	3	3	1.00	42	0.071
72	A	7	4	1.00	42	0.095
73	A	9	4	1.00	42	0.095
74	A	22	14	1.00	42	0.333
75	A	20	11	1.00	42	0.262
76	A	19	11	1.00	40	0.275
77	A	15	8	1.00	32	0.250
78	A	26	12	1.00	42	0.286
79	A	17	14	1.00	42	0.333
80	A	13	10	1.00	42	0.238
81	A	3	3	1.00	42	0.071
82	A	7	4	1.00	42	0.095
83	A	9	4	1.00	42	0.095
84	A	25	13	1.00	42	0.310
85	A	15	12	1.00	42	0.286
86	A	9	7	1.00	40	0.175
87	A	4	4	1.00	32	0.125
88	A	3	3	1.00	42	0.071
89	A	7	6	1.00	42	0.143
90	A	9	6	1.00	42	0.143
91	A	11	6	1.00	42	0.143
92	A	18	14	1.00	42	0.333
93	A	12	9	1.00	42	0.214
94	A	9	7	1.00	40	0.175
95	A	4	3	1.00	32	0.094

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
96	A	7	6	1.00	42	0.143
97	A	10	8	1.00	42	0.190
98	A	12	8	1.00	42	0.190
99	A	14	8	1.00	42	0.190
100	A	14	11	1.00	42	0.262
101	A	11	9	1.00	42	0.214
102	A	3	3	1.00	40	0.075
103	A	8	6	1.00	32	0.188
104	A	15	9	1.00	42	0.214
105	A	12	8	1.00	42	0.190
106	A	14	8	1.00	42	0.190
107	A	16	8	1.00	42	0.190
108	A	5	4	1.00	41	0.098
109	A	5	4	1.00	41	0.098
110	A	5	4	1.00	39	0.103
111	A	4	3	1.00	31	0.097
112	A	6	6	1.00	41	0.146
113	A	5	5	1.00	41	0.122
114	A	2	2	1.00	41	0.049
115	A	5	4	1.00	41	0.098
116	A	5	5	1.00	41	0.122
117	A	5	5	1.00	43	0.116
118	A	5	5	1.00	43	0.116
119	A	5	5	1.00	41	0.122
120	A	4	3	1.00	33	0.091
121	A	10	8	1.00	43	0.186
122	A	8	8	1.00	43	0.186
123	A	7	5	1.00	43	0.116
124	A	2	2	1.00	43	0.047
125	A	5	4	1.00	43	0.093
126	A	5	5	1.00	43	0.116
127	A	5	5	1.00	43	0.116
128	A	5	5	1.00	43	0.116
129	A	5	5	1.00	41	0.122
130	A	4	3	1.00	33	0.091

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
131	A	14	8	1.00	43	0.186
132	A	11	9	1.00	43	0.209
133	A	9	8	1.00	43	0.186
134	A	9	5	1.00	43	0.116
135	A	6	4	1.00	43	0.093
136	A	5	4	1.00	43	0.093
137	A	4	4	1.00	41	0.098
138	A	5	5	1.00	33	0.152
139	A	2	2	1.00	43	0.047
140	A	5	5	1.00	43	0.116
141	A	7	7	1.00	43	0.163
142	A	8	6	1.00	43	0.140
143	A	9	7	1.00	43	0.163
144	A	8	7	1.00	43	0.163
145	A	7	6	1.00	41	0.146
146	A	3	2	1.00	33	0.061
147	A	5	4	1.00	43	0.093
148	A	4	4	1.00	43	0.093
149	A	8	6	1.00	43	0.140
150	A	4	4	1.00	43	0.093
151	A	9	8	1.00	43	0.186
152	A	8	7	1.00	43	0.163
153	A	2	2	1.00	41	0.049
154	A	4	3	1.00	33	0.091
155	A	4	4	1.00	43	0.093
156	A	4	4	1.00	43	0.093
157	A	5	4	1.00	43	0.093
158	A	8	6	1.00	43	0.140
159	A	11	8	1.00	43	0.186
160	A	10	8	1.00	43	0.186
161	A	9	8	1.00	41	0.195
162	A	7	7	1.00	33	0.212
163	A	8	8	1.00	43	0.186
164	A	7	7	1.00	43	0.163
165	A	3	3	1.00	43	0.070

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
166	A	7	4	1.00	43	0.093
167	A	9	4	1.00	43	0.093
168	A	17	13	1.00	45	0.289
169	A	15	11	1.00	45	0.244
170	A	14	11	1.00	43	0.256
171	A	11	8	1.00	35	0.229
172	A	15	11	1.00	45	0.244
173	A	11	10	1.00	45	0.222
174	A	10	7	1.00	45	0.156
175	A	3	3	1.00	45	0.067
176	A	7	4	1.00	45	0.089
177	A	9	4	1.00	45	0.089
178	A	22	14	1.00	45	0.311
179	A	20	11	1.00	45	0.244
180	A	19	11	1.00	43	0.256
181	A	15	8	1.00	35	0.229
182	A	26	12	1.00	45	0.267
183	A	17	14	1.00	45	0.311
184	A	13	10	1.00	45	0.222
185	A	13	7	1.00	45	0.156
186	A	25	13	1.00	45	0.289
187	A	15	12	1.00	45	0.267
188	A	9	7	1.00	43	0.163
189	A	4	4	1.00	35	0.114
190	A	3	3	1.00	45	0.067
191	A	7	6	1.00	45	0.133
192	A	9	6	1.00	45	0.133
193	A	11	6	1.00	45	0.133
194	A	18	14	1.00	45	0.311
195	A	12	9	1.00	45	0.200
196	A	9	7	1.00	43	0.163
197	A	4	3	1.00	35	0.086
198	A	7	6	1.00	45	0.133
199	A	10	8	1.00	45	0.178
200	A	12	8	1.00	45	0.178

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
201	A	14	8	1.00	45	0.178
202	A	14	11	1.00	45	0.244
203	A	11	9	1.00	45	0.200
204	A	3	3	1.00	43	0.070
205	A	8	6	1.00	35	0.171
206	A	15	9	1.00	45	0.200
207	A	12	8	1.00	45	0.178
208	A	14	8	1.00	45	0.178
209	A	16	8	1.00	45	0.178
210	A	3	3	1.00	49	0.061
211	A	3	3	1.00	49	0.061
212	A	4	3	1.00	49	0.061
213	A	3	3	1.00	49	0.061
214	A	2	2	1.00	47	0.043
215	A	3	3	1.00	49	0.061
216	A	4	4	1.00	49	0.082
217	A	5	4	1.00	49	0.082
218	A	4	3	1.00	49	0.061
219	A	3	3	1.00	49	0.061
220	A	2	2	1.00	47	0.043
221	A	3	3	1.00	49	0.061
222	A	4	4	1.00	49	0.082
223	A	5	4	1.00	49	0.082
224	A	3	3	1.00	35	0.086
225	A	4	4	1.00	42	0.095
226	A	4	4	1.00	50	0.080
227	A	4	4	1.00	50	0.080
228	A	4	4	1.00	40	0.100
229	A	4	4	1.00	40	0.100
230	A	3	3	1.00	38	0.079
231	A	4	4	1.00	40	0.100
232	A	4	4	1.00	40	0.100
233	A	4	4	1.00	40	0.100
234	A	4	4	1.00	40	0.100
235	A	4	4	1.00	46	0.087

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
236	A	5	5	1.00	50	0.100
237	A	4	4	1.00	40	0.100
238	A	4	4	1.00	46	0.087
239	A	5	5	1.00	50	0.100
240	A	4	4	1.00	40	0.100
241	A	3	3	1.00	35	0.086
242	A	3	3	1.00	35	0.086
243	A	3	3	1.00	33	0.091
244	A	3	3	1.00	28	0.107
245	A	3	3	1.00	35	0.086
246	A	3	3	1.00	28	0.107
247	A	3	3	1.00	33	0.091
248	A	3	3	1.00	35	0.086
249	A	8	7	1.00	43	0.163
250	A	7	7	1.00	43	0.163
251	A	6	6	1.00	43	0.140
252	A	5	5	1.00	41	0.122
253	A	0	0	0.00	0	0.000
254	A	0	0	0.00	0	0.000
255	A	2	2	1.00	40	0.050
256	A	2	2	1.00	38	0.053
257	A	3	3	1.00	33	0.091
258	A	3	3	1.00	38	0.079
259	A	8	8	1.00	51	0.157
260	A	7	7	1.00	51	0.137
261	A	6	6	1.00	49	0.122
262	A	0	0	0.00	0	0.000
263	A	0	0	0.00	0	0.000

Chapter 3

Listing of integrals

Local contents

3.1 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 88
3.2 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 95
3.3 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 103
3.4 $\int (ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 109
3.5 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx$ 114
3.6 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx$ 119
3.7 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx$ 124
3.8 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx$ 129
3.9 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx$ 135
3.10 $\int (ag+bgx)^3(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 141
3.11 $\int (ag+bgx)^2(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 150
3.12 $\int (ag+bgx)(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 158
3.13 $\int (ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 166
3.14 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx$ 172
3.15 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx$ 178
3.16 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx$ 184
3.17 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx$ 190

3.18 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx$ 196

3.19 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx$ 202

3.20 $\int (ag+bgx)^3(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 209

3.21 $\int (ag+bgx)^2(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 220

3.22 $\int (ag+bgx)(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 230

3.23 $\int (ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$ 238

3.24 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx$ 245

3.25 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx$ 252

3.26 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx$ 259

3.27 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx$ 265

3.28 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx$ 271

3.29 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx$ 277

3.30 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^7}\,dx$ 284

3.31 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix}\,dx$ 291

3.32 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix}\,dx$ 299

3.33 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix}\,dx$ 306

3.34 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ci+dix}\,dx$ 312

3.35 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)}\,dx$ 317

3.36 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)}\,dx$ 322

3.37 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)}\,dx$ 328

3.38 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)}\,dx$ 334

3.39 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2}\,dx$ 341

3.40 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2}\,dx$ 349

3.41 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2}\,dx$ 356

3.42 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ci+dix)^2}\,dx$ 362

3.43 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)^2}\,dx$ 366

3.44 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)^2}\,dx$ . . . 371
3.45 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)^2}\,dx$ . . . 377
3.46 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)^2}\,dx$ . . . 384
3.47 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^3}\,dx$ . . . 392
3.48 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^3}\,dx$ . . . 398
3.49 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^3}\,dx$ . . . 404
3.50 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ci+dix)^3}\,dx$ . . . 409
3.51 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)^3}\,dx$ . . . 414
3.52 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)^3}\,dx$ . . . 420
3.53 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)^3}\,dx$ . . . 427
3.54 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)^3}\,dx$ . . . 436
3.55 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ . . . 445
3.56 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ . . . 453
3.57 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ . . . 460
3.58 $\int (ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ . . . 467
3.59 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$ . . . 472
3.60 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$ . . . 478
3.61 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$ . . . 484
3.62 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx$ . . . 492
3.63 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$ . . . 501
3.64 $\int (ag+bgx)^3(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ . . . 510
3.65 $\int (ag+bgx)^2(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ . . . 520
3.66 $\int (ag+bgx)(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ . . . 528
3.67 $\int (ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ . . . 535
3.68 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$ . . . 540

3.69 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$ 547

3.70 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$ 555

3.71 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx$ 562

3.72 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$ 571

3.73 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx$ 581

3.74 $\int (ag+bgx)^3(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ 592

3.75 $\int (ag+bgx)^2(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ 602

3.76 $\int (ag+bgx)(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ 612

3.77 $\int (ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$ 620

3.78 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$ 626

3.79 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$ 634

3.80 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$ 642

3.81 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$ 649

3.82 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx$ 658

3.83 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^7}\,dx$ 669

3.84 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$ 680

3.85 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$ 689

3.86 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$ 696

3.87 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$ 702

3.88 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)}\,dx$ 708

3.89 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)}\,dx$ 713

3.90 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)}\,dx$ 719

3.91 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)}\,dx$ 727

3.92 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$ 737

3.93 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$ 745

3.94 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$ 753

3.95 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$ 759

3.96 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)^2}\,dx$ 764

3.97 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)^2}\,dx$ 770

3.98 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)^2}\,dx$ 778

3.99 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)^2}\,dx$ 788

3.100 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$ 799

3.101 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$ 806

3.102 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$ 814

3.103 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$ 822

3.104 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)^3}\,dx$ 829

3.105 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)^3}\,dx$ 838

3.106 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)^3}\,dx$ 848

3.107 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)^3}\,dx$ 858

3.108 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 868

3.109 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 875

3.110 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 881

3.111 $\int (ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 886

3.112 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx$ 890

3.113 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx$ 895

3.114 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx$ 899

3.115 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx$ 903

3.116 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}\,dx$ 908

3.117 $\int (ag+bgx)^3(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 914

3.118 $\int (ag+bgx)^2(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 923

3.119 $\int (ag+bgx)(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 930

3.120 $\int (ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 936

3.121 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx$ 940

3.122 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx$ . . . 945

3.123 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx$ . . . 950

3.124 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx$ . . . 955

3.125 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}\,dx$ . . . 960

3.126 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^6}\,dx$ . . . 966

3.127 $\int (ag+bgx)^3(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ . . . 973

3.128 $\int (ag+bgx)^2(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ . . . 982

3.129 $\int (ag+bgx)(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ . . . 990

3.130 $\int (ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ . . . 997

3.131 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx$ . . . 1002

3.132 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx$ . . . 1007

3.133 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx$ . . . 1013

3.134 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx$ . . . 1019

3.135 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix}\,dx$ . . . 1025

3.136 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix}\,dx$ . . . 1031

3.137 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix}\,dx$ . . . 1037

3.138 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ci+dix}\,dx$ . . . 1042

3.139 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)}\,dx$ . . . 1046

3.140 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)}\,dx$ . . . 1050

3.141 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)}\,dx$ . . . 1055

3.142 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)}\,dx$ . . . 1061

3.143 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^2}\,dx$ . . . 1068

3.144 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^2}\,dx$ . . . 1075

3.145 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^2}\,dx$ . . . 1081

3.146 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ci+dix)^2}\,dx$ . . . 1086

3.147 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)^2}\,dx$ . . . 1090

3.148 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)^2}\,dx$ . . . 1094

3.149 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)^2}\,dx$ . . . 1099

3.150 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)^2}\,dx$ . . . 1106

3.151 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3}\,dx$ . . . 1114

3.152 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3}\,dx$ . . . 1120

3.153 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3}\,dx$ . . . 1125

3.154 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ci+dix)^3}\,dx$ . . . 1129

3.155 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)^3}\,dx$ . . . 1133

3.156 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)^3}\,dx$ . . . 1138

3.157 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)^3}\,dx$ . . . 1145

3.158 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)^3}\,dx$ . . . 1152

3.159 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1161

3.160 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1169

3.161 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1177

3.162 $\int (ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1184

3.163 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$ . . . 1189

3.164 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$ . . . 1195

3.165 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$ . . . 1201

3.166 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$ . . . 1208

3.167 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx$ . . . 1216

3.168 $\int (ag+bgx)^3(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1225

3.169 $\int (ag+bgx)^2(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1235

3.170 $\int (ag+bgx)(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1243

3.171 $\int (ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1251

3.172 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$ . . . 1257

3.173 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$ . . . 1265

3.174 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$ . . . 1273

3.175 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$ . . . 1281

3.176 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx$ . . . 1289

3.177 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^6}\,dx$ . . . 1298

3.178 $\int (ag+bgx)^3(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1309

3.179 $\int (ag+bgx)^2(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1320

3.180 $\int (ag+bgx)(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1329

3.181 $\int (ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ . . . 1337

3.182 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$ . . . 1343

3.183 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$ . . . 1351

3.184 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$ . . . 1360

3.185 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$ . . . 1367

3.186 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$ . . . 1375

3.187 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$ . . . 1384

3.188 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$ . . . 1392

3.189 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$ . . . 1398

3.190 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)}\,dx$ . . . 1403

3.191 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)}\,dx$ . . . 1408

3.192 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)}\,dx$ . . . 1414

3.193 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)}\,dx$ . . . 1422

3.194 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$ . . . 1431

3.195 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$ . . . 1440

3.196 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$ . . . 1448

3.197 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$ . . . 1454

3.198 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)^2}\,dx$ . . . 1459

3.199 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)^2}\,dx$ . . . 1465

3.200 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)^2}\,dx$ . . . 1472

3.201 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)^2}\,dx$ 1482

3.202 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$ 1491

3.203 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$ 1500

3.204 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$ 1509

3.205 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$ 1515

3.206 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)^3}\,dx$ 1521

3.207 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)^3}\,dx$ 1530

3.208 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)^3}\,dx$ 1540

3.209 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)^3}\,dx$ 1551

3.210 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p\,dx$ 1561

3.211 $\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p\,dx$ 1565

3.212 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3\,dx$ 1569

3.213 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ 1574

3.214 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 1578

3.215 $\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1582

3.216 $\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$ 1586

3.217 $\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$ 1590

3.218 $\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3\,dx$ 1595

3.219 $\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$ 1600

3.220 $\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$ 1604

3.221 $\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1608

3.222 $\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$ 1612

3.223 $\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$ 1616

3.224 $\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)}\,dx$ 1621

3.225 $\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ac+(bc+ad)x+bdx^2}\,dx$ 1624

3.226 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p\,dx$ 1627

3.227 $\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p\,dx$ 1631

3.228 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(a+bx)(c+dx)}\,dx$ 1635

3.229 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(a+bx)(c+dx)}\,dx$ 1639
3.230 $\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(c+dx)}\,dx$ 1643
3.231 $\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$ 1647
3.232 $\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$ 1650
3.233 $\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}\,dx$ 1654
3.234 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p}{(a+bx)(c+dx)}\,dx$ 1658
3.235 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p}{(af+bfx)(cg+dgx)}\,dx$ 1661
3.236 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p}{acf+(bc+ad)fx+bdfx^2}\,dx$ 1664
3.237 $\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$ 1668
3.238 $\int \frac{1}{(af+bfx)(cg+dgx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$ 1671
3.239 $\int \frac{1}{\left(acf+(bc+ad)fx+bdfx^2\right)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$ 1675
3.240 $\int \frac{(a+bx)^m(c+dx)^{-2-m}}{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}\,dx$ 1679
3.241 $\int \frac{(a+bx)^3}{(c+dx)^5\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1682
3.242 $\int \frac{(a+bx)^2}{(c+dx)^4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1685
3.243 $\int \frac{a+bx}{(c+dx)^3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1688
3.244 $\int \frac{1}{(c+dx)^2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1691
3.245 $\int \frac{1}{(a+bx)(c+dx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1694
3.246 $\int \frac{1}{(a+bx)^2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1697
3.247 $\int \frac{c+dx}{(a+bx)^3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1700
3.248 $\int \frac{(c+dx)^2}{(a+bx)^4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$ 1703
3.249 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^4}{(f+gx)(ah+bhx)}\,dx$ 1706
3.250 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(f+gx)(ah+bhx)}\,dx$ 1711
3.251 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(f+gx)(ah+bhx)}\,dx$ 1716
3.252 $\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(f+gx)(ah+bhx)}\,dx$ 1721
3.253 $\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$ 1726
3.254 $\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$ 1729
3.255 $\int \frac{\log\left(\frac{c+dx}{a+bx}\right)}{(a+bx)((a-c)h+(b-d)hx)}\,dx$ 1732
3.256 $\int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)}\,dx$ 1736
3.257 $\int \frac{\log\left(1-\frac{g(c+dx)}{a+bx}\right)}{(a+bx)(c+dx)}\,dx$ 1739
3.258 $\int \frac{\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)}{(a+bx)(c+dx)}\,dx$ 1743

3.259 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{afh+bghx^2+h(bfx+agx)}\,dx$ 1747

3.260 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{afh+bghx^2+h(bfx+agx)}\,dx$ 1752

3.261 $\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{afh+bghx^2+h(bfx+agx)}\,dx$ 1758

3.262 $\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$ 1763

3.263 $\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}\,dx$ 1766

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

Optimal. Leaf size=212

$$-\frac{B(bc-ad)^4g^3ix}{20bd^3}+\frac{B(bc-ad)^3g^3i(a+bx)^2}{40b^2d^2}-\frac{B(bc-ad)^2g^3i(a+bx)^3}{60b^2d}+\frac{g^3i(a+bx)^4(c+dx)\left(A+B\log\left(\right.\right.}{5b}$$

```
[Out] -1/20*B*(-a*d+b*c)^4*g^3*i*x/b/d^3+1/40*B*(-a*d+b*c)^3*g^3*i*(b*x+a)^2/b^2/
d^2-1/60*B*(-a*d+b*c)^2*g^3*i*(b*x+a)^3/b^2/d+1/5*g^3*i*(b*x+a)^4*(d*x+c)*(
A+B*ln(e*(b*x+a)/(d*x+c)))/b+1/20*(-a*d+b*c)*g^3*i*(b*x+a)^4*(A-B+B*ln(e*(b
*x+a)/(d*x+c)))/b^2+1/20*B*(-a*d+b*c)^5*g^3*i*ln(d*x+c)/b^2/d^4
```

Rubi [A]

time = 0.13, antiderivative size = 212, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2560, 2548, 21, 45}

$$\frac{g^3i(a+bx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A-B\right)}{20b^2}+\frac{g^3i(a+bx)^4(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b}+\frac{Bg^3i(bc-ad)^5\log(c+dx)}{20b^2d^4}+\frac{Bg^3i(a+bx)^2(bc-ad)^3}{40b^2d^2}-\frac{Bg^3i(a+bx)^3(bc-ad)^2}{60b^2d}-\frac{Bg^3ix(bc-ad)^4}{20bd^3}$$

Antiderivative was successfully verified.

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

```
[Out] -1/20*(B*(b*c - a*d)^4*g^3*i*x)/(b*d^3) + (B*(b*c - a*d)^3*g^3*i*(a + b*x)^
2)/(40*b^2*d^2) - (B*(b*c - a*d)^2*g^3*i*(a + b*x)^3)/(60*b^2*d) + (g^3*i*(
a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*b) + ((b*c -
a*d)*g^3*i*(a + b*x)^4*(A - B + B*Log[(e*(a + b*x))/(c + d*x)]))/(20*b^2) +
 (B*(b*c - a*d)^5*g^3*i*Log[c + d*x])/(20*b^2*d^4)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

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

Rule 2548

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*(
```

```
(A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*(m + 1))), x] - Dist[B*n*((b*c
- a*d)/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /;
 FreeQ[{a, b, c, d, e, f, g, A, B, m, n}, x] && EqQ[n + mn, 0] && NeQ[b*c -
 a*d, 0] && NeQ[m, -1] &&  !(EqQ[m, -2] && IntegerQ[n])
```

Rule 2560

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_)), x_Symbol] :> Sim
p[(f + g*x)^(m + 1)*(h + i*x)*((A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*
(m + 2))), x] + Dist[i*((b*c - a*d)/(b*d*(m + 2))), Int[(f + g*x)^m*(A - B*
n + B*Log[e*((a + b*x)^n/(c + d*x)^n)]), x], x] /; FreeQ[{a, b, c, d, e, f,
 g, h, i, A, B, m, n}, x] && EqQ[n + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d,
 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && IGtQ[m, -2]
```

Rubi steps

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

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

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

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

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

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

Mathematica [A]
time = 0.16, size = 261, normalized size = 1.23

$$\frac{g^3i\left(30(bc-ad)(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+24d(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-\frac{5B(bc-ad)^2\left(6bd(bc-ad)^2x+3d^2(-bc+ad)(a+bx)^2+2d^3(a+bx)^3-6(bc-ad)^3\log(c+dx)\right)}{d^4}+\frac{2B(bc-ad)\left(12bd(bc-ad)^3x-6d^2(bc-ad)^2(a+bx)^2+4d^3(bc-ad)(a+bx)^3-3d^4(a+bx)^4-12(bc-ad)^4\log(c+dx)\right)}{d^4}\right)}{120b^2}$$

Antiderivative was successfully verified.

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

[Out] (g^3*i*(30*(b*c - a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2
4*d*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (5*B*(b*c - a*d)^2*(
6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^
3 - 6*(b*c - a*d)^3*Log[c + d*x]))/d^4 + (2*B*(b*c - a*d)*(12*b*d*(b*c - a*
d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b*x)^3 -
3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]))/d^4))/(120*b^2)

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 9251 vs. $2(200) = 400$.
time = 0.67, size = 9252, normalized size = 43.64

method	result
risch	$-\frac{i\,g^3 b^2 B a\, c^2 x^2}{8d} + i\,g^3 A\, a^3 c x + \frac{i\,g^3 B\, a^3 c x}{4} - \frac{i\,g^3 b B\, a^2 c^2 x}{2d} + \frac{i\,g^3 b^2 B a\, c^3 x}{4d^2} + \frac{i\,g^3 b B \ln(-dx-c) a^2 c^3}{2d^2} + i\,g^3$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] result too large to display

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1026 vs. $2(196) = 392$.
time = 0.30, size = 1026, normalized size = 4.84

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 510 vs. $2(196) = 392$.
time = 0.46, size = 510, normalized size = 2.41

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1158 vs. $2(194) = 388$.
time = 4.64, size = 1158, normalized size = 5.46

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
*B*a**2*b**3*c**4*d*g**3*i + B*a*b**4*c**5*g**3*i)/(B*a**5*d**5*g**3*i - 5*
B*a**4*b*c*d**4*g**3*i - 10*B*a**3*b**2*c**2*d**3*g**3*i + 10*B*a**2*b**3*c
**3*d**2*g**3*i - 5*B*a*b**4*c**4*d*g**3*i + B*b**5*c**5*g**3*i))/(20*b**2)
 - B*c**2*g**3*i*(10*a**3*d**3 - 10*a**2*b*c*d**2 + 5*a*b**2*c**2*d - b**3*
c**3)*log(x + (B*a**5*c*d**4*g**3*i - 15*B*a**4*b*c**2*d**3*g**3*i + 10*B*a
**3*b**2*c**3*d**2*g**3*i - 5*B*a**2*b**3*c**4*d*g**3*i + B*a*b**4*c**5*g**
3*i + B*a*b*c**2*g**3*i*(10*a**3*d**3 - 10*a**2*b*c*d**2 + 5*a*b**2*c**2*d
- b**3*c**3) - B*b**2*c**3*g**3*i*(10*a**3*d**3 - 10*a**2*b*c*d**2 + 5*a*b*
*2*c**2*d - b**3*c**3)/d)/(B*a**5*d**5*g**3*i - 5*B*a**4*b*c*d**4*g**3*i -
10*B*a**3*b**2*c**2*d**3*g**3*i + 10*B*a**2*b**3*c**3*d**2*g**3*i - 5*B*a*b
**4*c**4*d*g**3*i + B*b**5*c**5*g**3*i))/(20*d**4) + x**4*(3*A*a*b**2*d*g**
3*i/4 + A*b**3*c*g**3*i/4 + B*a*b**2*d*g**3*i/20 - B*b**3*c*g**3*i/20) + x*
*3*(A*a**2*b*d*g**3*i + A*a*b**2*c*g**3*i + 11*B*a**2*b*d*g**3*i/60 - B*a*b
**2*c*g**3*i/6 - B*b**3*c**2*g**3*i/(60*d)) + x**2*(A*a**3*d*g**3*i/2 + 3*A
*a**2*b*c*g**3*i/2 + 9*B*a**3*d*g**3*i/40 - B*a**2*b*c*g**3*i/8 - B*a*b**2*
c**2*g**3*i/(8*d) + B*b**3*c**3*g**3*i/(40*d**2)) + x*(A*a**3*c*g**3*i + B*
a**4*d*g**3*i/(20*b) + B*a**3*c*g**3*i/4 - B*a**2*b*c**2*g**3*i/(2*d) + B*a
*b**2*c**3*g**3*i/(4*d**2) - B*b**3*c**4*g**3*i/(20*d**3)) + (B*a**3*c*g**3
*i*x + B*a**3*d*g**3*i*x**2/2 + 3*B*a**2*b*c*g**3*i*x**2/2 + B*a**2*b*d*g**
3*i*x**3 + B*a*b**2*c*g**3*i*x**3 + 3*B*a*b**2*d*g**3*i*x**4/4 + B*b**3*c*g
**3*i*x**4/4 + B*b**3*d*g**3*i*x**5/5)*log(e*(a + b*x)/(c + d*x))
```

<u>Giac</u> [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5563 vs. 2(196) = 392.
time = 4.24, size = 5563, normalized size = 26.24

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/120*(-6*I*B*b^11*c^6*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 36*I
*B*a*b^10*c^5*d*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 90*I*B*a^2*
b^9*c^4*d^2*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 120*I*B*a^3*b^8
*c^3*d^3*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 90*I*B*a^4*b^7*c^2
*d^4*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 36*I*B*a^5*b^6*c*d^5*g
^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 6*I*B*a^6*b^5*d^6*g^3*e^6*lo
g(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 30*I*(b*x*e + a*e)*B*b^10*c^6*d*g^3*e
^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 180*I*(b*x*e + a*e)*B*
a*b^9*c^5*d^2*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 450
*I*(b*x*e + a*e)*B*a^2*b^8*c^4*d^3*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c) - 600*I*(b*x*e + a*e)*B*a^3*b^7*c^3*d^4*g^3*e^5*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 450*I*(b*x*e + a*e)*B*a^4*b^6*c^2*d^
5*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 180*I*(b*x*e +
```

a*e)*B*a^5*b^5*c*d^6*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c
) + 30*I*(b*x*e + a*e)*B*a^6*b^4*d^7*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*
x + c))/(d*x + c) - 60*I*(b*x*e + a*e)^2*B*b^9*c^6*d^2*g^3*e^4*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 360*I*(b*x*e + a*e)^2*B*a*b^8*c^5*d
^3*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 900*I*(b*x*e
 + a*e)^2*B*a^2*b^7*c^4*d^4*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(
d*x + c)^2 + 1200*I*(b*x*e + a*e)^2*B*a^3*b^6*c^3*d^5*g^3*e^4*log(-b*e + (b
*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 900*I*(b*x*e + a*e)^2*B*a^4*b^5*c^2*
d^6*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 360*I*(b*x*
e + a*e)^2*B*a^5*b^4*c*d^7*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^2 - 60*I*(b*x*e + a*e)^2*B*a^6*b^3*d^8*g^3*e^4*log(-b*e + (b*x*e +
a*e)*d/(d*x + c))/(d*x + c)^2 + 60*I*(b*x*e + a*e)^3*B*b^8*c^6*d^3*g^3*e^3*
log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 360*I*(b*x*e + a*e)^3*B
*a*b^7*c^5*d^4*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 +
900*I*(b*x*e + a*e)^3*B*a^2*b^6*c^4*d^5*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/
(d*x + c))/(d*x + c)^3 - 1200*I*(b*x*e + a*e)^3*B*a^3*b^5*c^3*d^6*g^3*e^3*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 900*I*(b*x*e + a*e)^3*B*
a^4*b^4*c^2*d^7*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 -
 360*I*(b*x*e + a*e)^3*B*a^5*b^3*c*d^8*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(
d*x + c))/(d*x + c)^3 + 60*I*(b*x*e + a*e)^3*B*a^6*b^2*d^9*g^3*e^3*log(-b*e
 + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 30*I*(b*x*e + a*e)^4*B*b^7*c^6*
d^4*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 180*I*(b*x*
e + a*e)^4*B*a*b^6*c^5*d^5*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^4 - 450*I*(b*x*e + a*e)^4*B*a^2*b^5*c^4*d^6*g^3*e^2*log(-b*e + (b*x
*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 600*I*(b*x*e + a*e)^4*B*a^3*b^4*c^3*d^
7*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 450*I*(b*x*e
+ a*e)^4*B*a^4*b^3*c^2*d^8*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^4 + 180*I*(b*x*e + a*e)^4*B*a^5*b^2*c*d^9*g^3*e^2*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^4 - 30*I*(b*x*e + a*e)^4*B*a^6*b*d^10*g^3*e^
2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 6*I*(b*x*e + a*e)^5*B
*b^6*c^6*d^5*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 36*I
*(b*x*e + a*e)^5*B*a*b^5*c^5*d^6*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c)
)/(d*x + c)^5 + 90*I*(b*x*e + a*e)^5*B*a^2*b^4*c^4*d^7*g^3*e*log(-b*e + (b*
x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 120*I*(b*x*e + a*e)^5*B*a^3*b^3*c^3*d
^8*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 90*I*(b*x*e +
a*e)^5*B*a^4*b^2*c^2*d^9*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x +
 c)^5 - 36*I*(b*x*e + a*e)^5*B*a^5*b*c*d^10*g^3*e*log(-b*e + (b*x*e + a*e)*
d/(d*x + c))/(d*x + c)^5 + 6*I*(b*x*e + a*e)^5*B*a^6*d^11*g^3*e*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 30*I*(b*x*e + a*e)^4*B*b^7*c^6*d^4
*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 180*I*(b*x*e + a*e)^4*B
*a*b^6*c^5*d^5*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 450*I*(b*
x*e + a*e)^4*B*a^2*b^5*c^4*d^6*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x +
c)^4 - 600*I*(b*x*e + a*e)^4*B*a^3*b^4*c^3*d^7*g^3*e^2*log((b*x*e + a*e)/(d
*x + c))/(d*x + c)^4 + 450*I*(b*x*e + a*e)^4*B*a^4*b^3*c^2*d^8*g^3*e^2*log(
(b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 180*I*(b*x*e + a*e)^4*B*a^5*b^2*c*d^

```
9*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 30*I*(b*x*e + a*e)^4*B
*a^6*b*d^10*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 6*I*(b*x*e +
 a*e)^5*B*b^6*c^6*d^5*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^5 + 36*I
*(b*x*e + a*e)^5*B*a*b^5*c^5*d^6*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x +
c)^5 - 90*I*(b*x*e + a*e)^5*B*a^2*b^4*c^4*d^7*g^3*e*log((b*x*e + a*e)/(d*x
+ c))/(d*x + c)^5 + 120*I*(b*x*e + a*e)^5*B*a^3*b^3*c^3*d^8*g^3*e*log((b*x*
e + a*e)/(d*x + c))/(d*x + c)^5 - 90*I*(b*x*e + a*e)^5*B*a^4*b^2*c^2*d^9*g^
3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^5 + 36*I*(b*x*e + a*e)^5*B*a^5*b
*c*d^10*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x...
```

Mupad [B]
time = 5.38, size = 1195, normalized size = 5.64

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*((a*c*(((20*a*d + 20*b*c)*((b^2*g^3*i*(20*A*a*d + 10*A*b*c + B*a*d - B*b*
c))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/20))/(20*b*d) - (b*g^3*i*(24*A*a^2*
d^2 + 4*A*b^2*c^2 + 3*B*a^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d - 2*B*a*b*c*d))/
(4*d) + A*a*b^2*c*g^3*i))/(b*d) - ((20*a*d + 20*b*c)*(((20*a*d + 20*b*c)*((
(20*a*d + 20*b*c)*((b^2*g^3*i*(20*A*a*d + 10*A*b*c + B*a*d - B*b*c))/5 - (A
*b^2*g^3*i*(20*a*d + 20*b*c))/20))/(20*b*d) - (b*g^3*i*(24*A*a^2*d^2 + 4*A*
b^2*c^2 + 3*B*a^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d - 2*B*a*b*c*d))/(4*d) + A*
a*b^2*c*g^3*i))/(20*b*d) - (a*c*((b^2*g^3*i*(20*A*a*d + 10*A*b*c + B*a*d -
B*b*c))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/20))/(b*d) + (a*g^3*i*(4*A*a^2*
d^2 + 4*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 12*A*a*b*c*d))/d))/(20*b*d) + (
a^2*g^3*i*(2*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2 - 3*B*b^2*c^2 + 16*A*a*b*
c*d + 2*B*a*b*c*d))/(2*b*d)) + x^4*((b^2*g^3*i*(20*A*a*d + 10*A*b*c + B*a*d
 - B*b*c))/20 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/80) - x^3*(((20*a*d + 20*b*
c)*((b^2*g^3*i*(20*A*a*d + 10*A*b*c + B*a*d - B*b*c))/5 - (A*b^2*g^3*i*(20*
a*d + 20*b*c))/20))/(60*b*d) - (b*g^3*i*(24*A*a^2*d^2 + 4*A*b^2*c^2 + 3*B*a
^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d - 2*B*a*b*c*d))/(12*d) + (A*a*b^2*c*g^3*i
)/3) + x^2*(((20*a*d + 20*b*c)*(((20*a*d + 20*b*c)*((b^2*g^3*i*(20*A*a*d +
10*A*b*c + B*a*d - B*b*c))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/20))/(20*b*d
) - (b*g^3*i*(24*A*a^2*d^2 + 4*A*b^2*c^2 + 3*B*a^2*d^2 - B*b^2*c^2 + 32*A*a
*b*c*d - 2*B*a*b*c*d))/(4*d) + A*a*b^2*c*g^3*i))/(40*b*d) - (a*c*((b^2*g^3*
i*(20*A*a*d + 10*A*b*c + B*a*d - B*b*c))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c)
)/20))/(2*b*d) + (a*g^3*i*(4*A*a^2*d^2 + 4*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^
2 + 12*A*a*b*c*d))/(2*d)) + log((e*(a + b*x))/(c + d*x))*((B*a^2*g^3*i*x^2*
(a*d + 3*b*c))/2 + (B*b^2*g^3*i*x^4*(3*a*d + b*c))/4 + B*a^3*c*g^3*i*x + (B
*b^3*d*g^3*i*x^5)/5 + B*a*b*g^3*i*x^3*(a*d + b*c)) - (log(a + b*x)*(B*a^5*d
*g^3*i - 5*B*a^4*b*c*g^3*i))/(20*b^2) + (log(c + d*x)*(B*b^3*c^5*g^3*i - 10
*B*a^3*c^2*d^3*g^3*i - 5*B*a*b^2*c^4*d*g^3*i + 10*B*a^2*b*c^3*d^2*g^3*i))/(
20*d^4) + (A*b^3*d*g^3*i*x^5)/5
```

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

Optimal. Leaf size=180

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

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

Rubi [A]
time = 0.10, antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2560, 2548, 21, 45}

$$\frac{g^2i(a+bx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A-B\right)}{12b^2}+\frac{g^2i(a+bx)^3(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b}-\frac{Bg^2i(bc-ad)^4\log(c+dx)}{12b^2d^3}-\frac{Bg^2i(a+bx)^2(bc-ad)^2}{24b^2d}+\frac{Bg^2ix(bc-ad)^3}{12bd^2}$$

Antiderivative was successfully verified.

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

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

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

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

Rule 2548

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*(
```

```
(A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*(m + 1))), x] - Dist[B*n*((b*c
- a*d)/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /;
 FreeQ[{a, b, c, d, e, f, g, A, B, m, n}, x] && EqQ[n + mn, 0] && NeQ[b*c -
 a*d, 0] && NeQ[m, -1] &&  !(EqQ[m, -2] && IntegerQ[n])
```

Rule 2560

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_)), x_Symbol] :> Sim
p[(f + g*x)^(m + 1)*(h + i*x)*((A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*
(m + 2))), x] + Dist[i*((b*c - a*d)/(b*d*(m + 2))), Int[(f + g*x)^m*(A - B*
n + B*Log[e*((a + b*x)^n/(c + d*x)^n)]), x], x] /; FreeQ[{a, b, c, d, e, f,
 g, h, i, A, B, m, n}, x] && EqQ[n + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d,
 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && IGtQ[m, -2]
```

Rubi steps

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

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

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

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

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

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

Mathematica [A]
time = 0.11, size = 217, normalized size = 1.21

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

Antiderivative was successfully verified.

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

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

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 4929 vs. $2(170) = 340$.
time = 0.59, size = 4930, normalized size = 27.39

method	result
risch	$\frac{i\,g^2 Bx\left(3b^2 d\,x^3+8abd\,x^2+4b^2 c\,x^2+6x\,a^2 d+12abcx+12c\,a^2\right)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{12}+\frac{i\,g^2 b^2 dA\,x^4}{4}+\frac{2i\,g^2 bdAa\,x^3}{3}+\frac{i\,g^2 b^2 A}{3}$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
b*c)*e/d/(d*x+c))*d)*c^3+5/24*B/d*e*g^2*i/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*d)^2*b^3*c^3+1/12*B*d^2*e^2*g^2*i*b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)
^3*a^3+3/2*B*d^2/e*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a*c^2-1/2*B*d/e*g^2*i
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b/(b*e-(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*c^3-3/2*B*d*e*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*d)^4*b^3*c^3-1/4*B/e*g^2*i*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a*c^2+1
/4*B*g^2*i*b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a*c^2+1/12*B*d^2*g^2*i/b
/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^3-1/12*B/d*g^2*i*b^2/(b*e-(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*d)*c^3-A*d^2*e*g^2*i*(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c
^2*d-b^3*c^3)*(-2/3*b*e/d^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3+1/2/d^3
/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2+1/4*b^2*e^2/d^3/(b*e-(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*d)^4)-1/4*B*d*g^2*i/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*
a^2*c-3*B*d*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x
+c))*b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a*c^2-6*B*d^2*g^2*i*b*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-
b*c)*e/d/(d*x+c))*d)^3*a*c^2-3*B*d^3*g^2*i*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a
*c^2-2/3*B*d^2/e*g^2*i*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*c^3+5/8*B*d*e*g^2*i/(
b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a^2*b*c+2*B*d^3*e*g^2*i*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*d)^3*a^3-1/4*B*d*e^2*g^2*i*b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*d)^3*a^2*c-3*B*d*e^2*g^2*i*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d
-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a*c^2-3/2*B*d^3/
e*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/b/(
b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a^2*c-2*B*d^4/e*g^2*i/b*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*d)^3*a^2*c-3/4*B*d^5/e*g^2*i/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^2
*c-9/2*B*d^3*e*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(
d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^2*b*c+9/2*B*d^2*e*g^2*i
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a*b^2*c^2-6*B*d^2*e*g^2*i*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*d)^3*a^2*b*c+6*B*d*e*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*b^2*c^2+2*B*d^3/
e*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/(b*
e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c^2+2/3*B*d^5/e*g^2*i/b^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)
*e/d/(d*x+c))*d)^3*a^3+1/2*B*d^4/e*g^2*i*ln(b*e...
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 675 vs. $2(167) = 334$.

time = 0.30, size = 675, normalized size = 3.75

$$[illegible]$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 375 vs. $2(167) = 334$.
time = 0.40, size = 375, normalized size = 2.08

$$[illegible]$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 850 vs. $2(163) = 326$.

time = 2.82, size = 850, normalized size = 4.72

$$\frac{Ab^2dg^2ix^4}{4}-\frac{Ba^3g^2i(ad-4bc)\log\left(x+\frac{Ba^4cd^3g^2i+\frac{Ba^4d^3g^2i(ad-4bc)}{b}-10Ba^3bc^2d^2g^2i-Ba^3cd^2g^2i(ad-4bc)+4Ba^2b^2c^3dg^2i-Bab^3c^4g^2i}{Ba^4d^4g^2i-4Ba^3bcd^3g^2i-6Ba^2b^2c^2d^2g^2i+4Bab^3c^3dg^2i-Bb^4c^4g^2i}\right)}{12b^2}-\frac{Bc^2g^2i(6a^2d^2-4abcd+b^2c^2)\log\left(x+\frac{Ba^4cd^3g^2i-10Ba^3bc^2d^2g^2i+4Ba^2b^2c^3dg^2i-Bab^3c^4g^2i+Babc^2g^2i(6a^2d^2-4abcd+b^2c^2)-\frac{Bb^2c^3g^2i(6a^2d^2-4abcd+b^2c^2)}{d}}{Ba^4d^4g^2i-4Ba^3bcd^3g^2i-6Ba^2b^2c^2d^2g^2i+4Bab^3c^3dg^2i-Bb^4c^4g^2i}\right)}{12d^3}+x^3\cdot\left(\frac{2Aabdg^2i}{3}+\frac{Ab^2cg^2i}{3}+\frac{Babdg^2i}{12}-\frac{Bb^2cg^2i}{12}\right)+x^2\left(\frac{Aa^2dg^2i}{2}+Aabcg^2i+\frac{5Ba^2dg^2i}{24}-\frac{Babcg^2i}{6}-\frac{Bb^2c^2g^2i}{24d}\right)+x\left(Aa^2cg^2i+\frac{Ba^3dg^2i}{12b}+\frac{Ba^2cg^2i}{6}-\frac{Babc^2g^2i}{3d}+\frac{Bb^2c^3g^2i}{12d^2}\right)+\left(Ba^2cg^2ix+\frac{Ba^2dg^2ix^2}{2}+Babcg^2ix^2+\frac{2Babdg^2ix^3}{3}+\frac{Bb^2cg^2ix^3}{3}+\frac{Bb^2dg^2ix^4}{4}\right)\log\left(\frac{e(a+bx)}{c+dx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3911 vs. 2(167) = 334.
time = 2.78, size = 3911, normalized size = 21.73

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(2*I*B*b^9*c^5*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 10*I*B*
a*b^8*c^4*d*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 20*I*B*a^2*b^7*
c^3*d^2*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 20*I*B*a^3*b^6*c^2*
d^3*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 10*I*B*a^4*b^5*c*d^4*g^
2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 2*I*B*a^5*b^4*d^5*g^2*e^5*log
(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 8*I*(b*x*e + a*e)*B*b^8*c^5*d*g^2*e^4*
log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 40*I*(b*x*e + a*e)*B*a*b^
7*c^4*d^2*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 80*I*(b
*x*e + a*e)*B*a^2*b^6*c^3*d^3*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))
```

/(d*x + c) + 80*I*(b*x*e + a*e)*B*a^3*b^5*c^2*d^4*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 40*I*(b*x*e + a*e)*B*a^4*b^4*c*d^5*g^2*e^4 *log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 8*I*(b*x*e + a*e)*B*a^5* b^3*d^6*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 12*I*(b*x *e + a*e)^2*B*b^7*c^5*d^2*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d* x + c)^2 - 60*I*(b*x*e + a*e)^2*B*a*b^6*c^4*d^3*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 120*I*(b*x*e + a*e)^2*B*a^2*b^5*c^3*d^4*g^ 2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 120*I*(b*x*e + a* e)^2*B*a^3*b^4*c^2*d^5*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 60*I*(b*x*e + a*e)^2*B*a^4*b^3*c*d^6*g^2*e^3*log(-b*e + (b*x*e + a* e)*d/(d*x + c))/(d*x + c)^2 - 12*I*(b*x*e + a*e)^2*B*a^5*b^2*d^7*g^2*e^3*lo g(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 8*I*(b*x*e + a*e)^3*B*b^6 *c^5*d^3*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 40*I*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 80*I*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 80*I*(b*x*e + a*e)^3*B*a^3*b^3*c^2* d^6*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 40*I*(b*x*e + a*e)^3*B*a^4*b^2*c*d^7*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d* x + c)^3 + 8*I*(b*x*e + a*e)^3*B*a^5*b*d^8*g^2*e^2*log(-b*e + (b*x*e + a*e) *d/(d*x + c))/(d*x + c)^3 + 2*I*(b*x*e + a*e)^4*B*b^5*c^5*d^4*g^2*e*log(-b* e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 10*I*(b*x*e + a*e)^4*B*a*b^4*c ^4*d^5*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 20*I*(b*x* e + a*e)^4*B*a^2*b^3*c^3*d^6*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d *x + c)^4 - 20*I*(b*x*e + a*e)^4*B*a^3*b^2*c^2*d^7*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 10*I*(b*x*e + a*e)^4*B*a^4*b*c*d^8*g^2*e* log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 2*I*(b*x*e + a*e)^4*B*a ^5*d^9*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 8*I*(b*x*e + a*e)^3*B*b^6*c^5*d^3*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 40*I*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 80*I*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g^2*e^2*log((b*x*e + a* e)/(d*x + c))/(d*x + c)^3 - 80*I*(b*x*e + a*e)^3*B*a^3*b^3*c^2*d^6*g^2*e^2* log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 40*I*(b*x*e + a*e)^3*B*a^4*b^2*c *d^7*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 8*I*(b*x*e + a*e)^3 *B*a^5*b*d^8*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 2*I*(b*x*e + a*e)^4*B*b^5*c^5*d^4*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 10* I*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 20*I*(b*x*e + a*e)^4*B*a^2*b^3*c^3*d^6*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 20*I*(b*x*e + a*e)^4*B*a^3*b^2*c^2*d^7*g^2*e*log((b*x* e + a*e)/(d*x + c))/(d*x + c)^4 - 10*I*(b*x*e + a*e)^4*B*a^4*b*c*d^8*g^2*e* log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 2*I*(b*x*e + a*e)^4*B*a^5*d^9*g^ 2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 2*I*A*b^9*c^5*g^2*e^5 + I*B* b^9*c^5*g^2*e^5 - 10*I*A*a*b^8*c^4*d*g^2*e^5 - 5*I*B*a*b^8*c^4*d*g^2*e^5 + 20*I*A*a^2*b^7*c^3*d^2*g^2*e^5 + 10*I*B*a^2*b^7*c^3*d^2*g^2*e^5 - 20*I*A*a^ 3*b^6*c^2*d^3*g^2*e^5 - 10*I*B*a^3*b^6*c^2*d^3*g^2*e^5 + 10*I*A*a^4*b^5*c*d ^4*g^2*e^5 + 5*I*B*a^4*b^5*c*d^4*g^2*e^5 - 2*I*A*a^5*b^4*d^5*g^2*e^5 - I*B*

```
a^5*b^4*d^5*g^2*e^5 - 8*I*(b*x*e + a*e)*A*b^8*c^5*d*g^2*e^4/(d*x + c) - 2*I
*(b*x*e + a*e)*B*b^8*c^5*d*g^2*e^4/(d*x + c) + 40*I*(b*x*e + a*e)*A*a*b^7*c
^4*d^2*g^2*e^4/(d*x + c) + 10*I*(b*x*e + a*e)*B*a*b^7*c^4*d^2*g^2*e^4/(d*x
+ c) - 80*I*(b*x*e + a*e)*A*a^2*b^6*c^3*d^3*g^2*e^4/(d*x + c) - 20*I*(b*x*e
 + a*e)*B*a^2*b^6*c^3*d^3*g^2*e^4/(d*x + c) + 80*I*(b*x*e + a*e)*A*a^3*b^5*
c^2*d^4*g^2*e^4/(d*x + c) + 20*I*(b*x*e + a*e)*B*a^3*b^5*c^2*d^4*g^2*e^4/(d
*x + c) - 40*I*(b*x*e + a*e)*A*a^4*b^4*c*d^5*g^2*e^4/(d*x + c) - 10*I*(b*x*
e + a*e)*B*a^4*b^4*c*d^5*g^2*e^4/(d*x + c) + 8*I*(b*x*e + a*e)*A*a^5*b^3*d^
6*g^2*e^4/(d*x + c) + 2*I*(b*x*e + a*e)*B*a^5*b^3*d^6*g^2*e^4/(d*x + c) + 1
2*I*(b*x*e + a*e)^2*A*b^7*c^5*d^2*g^2*e^3/(d*x + c)^2 - I*(b*x*e + a*e)^2*B
*b^7*c^5*d^2*g^2*e^3/(d*x + c)^2 - 60*I*(b*x*e + a*e)^2*A*a*b^6*c^4*d^3*g^2
*e^3/(d*x + c)^2 + 5*I*(b*x*e + a*e)^2*B*a*b^6*c^4*d^3*g^2*e^3/(d*x + c)^2
+ 120*I*(b*x*e + a*e)^2*A*a^2*b^5*c^3*d^4*g^2*e...
```

Mupad [B]
time = 5.11, size = 638, normalized size = 3.54

$$x^3\left(\frac{b\,g^2\,i\,\left(12\,A\,a\,d+8\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{12}-\frac{A\,b\,g^2\,i\,\left(12\,a\,d+12\,b\,c\right)}{36}\right)-x^2\left(\frac{\left(\frac{b\,g^2\,i\,\left(12\,A\,a\,d+8\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{4}-\frac{A\,b\,g^2\,i\,\left(12\,a\,d+12\,b\,c\right)}{12}\right)\,\left(12\,a\,d+12\,b\,c\right)}{24\,b\,d}-\frac{g^2\,i\,\left(9\,A\,a^2\,d^2+3\,A\,b^2\,c^2+2\,B\,a^2\,d^2-B\,b^2\,c^2+18\,A\,a\,b\,c\,d-B\,a\,b\,c\,d\right)}{6\,d}+\frac{A\,a\,b\,c\,g^2\,i}{2}\right)+\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(B\,a^2\,c\,g^2\,i\,x+\frac{B\,a\,g^2\,i\,x^2\,\left(a\,d+2\,b\,c\right)}{2}+\frac{B\,b\,g^2\,i\,x^3\,\left(2\,a\,d+b\,c\right)}{3}+\frac{B\,b^2\,d\,g^2\,i\,x^4}{4}\right)+x\left(\frac{\left(12\,a\,d+12\,b\,c\right)\,\left(\frac{\left(\frac{b\,g^2\,i\,\left(12\,A\,a\,d+8\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{4}-\frac{A\,b\,g^2\,i\,\left(12\,a\,d+12\,b\,c\right)}{12}\right)\,\left(12\,a\,d+12\,b\,c\right)}{12\,b\,d}-\frac{g^2\,i\,\left(9\,A\,a^2\,d^2+3\,A\,b^2\,c^2+2\,B\,a^2\,d^2-B\,b^2\,c^2+18\,A\,a\,b\,c\,d-B\,a\,b\,c\,d\right)}{3\,d}+A\,a\,b\,c\,g^2\,i\right)}{12\,b\,d}-\frac{a\,c\,\left(\frac{b\,g^2\,i\,\left(12\,A\,a\,d+8\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{4}-\frac{A\,b\,g^2\,i\,\left(12\,a\,d+12\,b\,c\right)}{12}\right)}{b\,d}+\frac{a\,g^2\,i\,\left(2\,A\,a^2\,d^2+6\,A\,b^2\,c^2+B\,a^2\,d^2-2\,B\,b^2\,c^2+12\,A\,a\,b\,c\,d+B\,a\,b\,c\,d\right)}{2\,b\,d}\right)-\frac{\ln\left(c+d\,x\right)\,\left(6\,B\,i\,a^2\,c^2\,d^2\,g^2-4\,B\,i\,a\,b\,c^3\,d\,g^2+B\,i\,b^2\,c^4\,g^2\right)}{12\,d^3}-\frac{\ln\left(a+b\,x\right)\,\left(B\,a^4\,d\,g^2\,i-4\,B\,a^3\,b\,c\,g^2\,i\right)}{12\,b^2}+\frac{A\,b^2\,d\,g^2\,i\,x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^3*((b*g^2*i*(12*A*a*d + 8*A*b*c + B*a*d - B*b*c))/12 - (A*b*g^2*i*(12*a*d
 + 12*b*c))/36) - x^2*((((b*g^2*i*(12*A*a*d + 8*A*b*c + B*a*d - B*b*c))/4 -
 (A*b*g^2*i*(12*a*d + 12*b*c))/12)*(12*a*d + 12*b*c))/(24*b*d) - (g^2*i*(9*
A*a^2*d^2 + 3*A*b^2*c^2 + 2*B*a^2*d^2 - B*b^2*c^2 + 18*A*a*b*c*d - B*a*b*c*
d))/(6*d) + (A*a*b*c*g^2*i)/2) + log((e*(a + b*x))/(c + d*x))*(B*a^2*c*g^2*
i*x + (B*a*g^2*i*x^2*(a*d + 2*b*c))/2 + (B*b*g^2*i*x^3*(2*a*d + b*c))/3 + (
B*b^2*d*g^2*i*x^4)/4) + x*(((12*a*d + 12*b*c)*((((b*g^2*i*(12*A*a*d + 8*A*b
*c + B*a*d - B*b*c))/4 - (A*b*g^2*i*(12*a*d + 12*b*c))/12)*(12*a*d + 12*b*c
))/(12*b*d) - (g^2*i*(9*A*a^2*d^2 + 3*A*b^2*c^2 + 2*B*a^2*d^2 - B*b^2*c^2 +
 18*A*a*b*c*d - B*a*b*c*d))/(3*d) + A*a*b*c*g^2*i))/(12*b*d) - (a*c*((b*g^2
*i*(12*A*a*d + 8*A*b*c + B*a*d - B*b*c))/4 - (A*b*g^2*i*(12*a*d + 12*b*c))/
12))/(b*d) + (a*g^2*i*(2*A*a^2*d^2 + 6*A*b^2*c^2 + B*a^2*d^2 - 2*B*b^2*c^2
+ 12*A*a*b*c*d + B*a*b*c*d))/(2*b*d)) - (log(c + d*x)*(B*b^2*c^4*g^2*i + 6*
B*a^2*c^2*d^2*g^2*i - 4*B*a*b*c^3*d*g^2*i))/(12*d^3) - (log(a + b*x)*(B*a^4
*d*g^2*i - 4*B*a^3*b*c*g^2*i))/(12*b^2) + (A*b^2*d*g^2*i*x^4)/4
```

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

Optimal. Leaf size=140

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

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

Rubi [A]

time = 0.07, antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2560, 2548, 21, 45}

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

Antiderivative was successfully verified.

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

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

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

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

Rule 2548

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*(
(A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*(m + 1))), x] - Dist[B*n*((b*c
```

```
- a*d)/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /;
 FreeQ[{a, b, c, d, e, f, g, A, B, m, n}, x] && EqQ[n + mn, 0] && NeQ[b*c -
 a*d, 0] && NeQ[m, -1] &&  !(EqQ[m, -2] && IntegerQ[n])
```

Rule 2560

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_)), x_Symbol] :> Sim
p[(f + g*x)^(m + 1)*(h + i*x)*((A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*
(m + 2))), x] + Dist[i*((b*c - a*d)/(b*d*(m + 2))), Int[(f + g*x)^m*(A - B*
n + B*Log[e*((a + b*x)^n/(c + d*x)^n)]), x], x] /; FreeQ[{a, b, c, d, e, f,
 g, h, i, A, B, m, n}, x] && EqQ[n + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d,
 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && IGtQ[m, -2]
```

Rubi steps

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

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

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

$$=3aAcgx+\frac{3aBcg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}+\frac{3}{2}(bc+a$$

$$=3aAcgx+\frac{3aBcg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}+\frac{3}{2}(bc+a$$

$$=3aAcgx-\frac{B(bc-ad)(bc+ad)gx}{2bd}-\frac{1}{2}B(bc-ad)g$$

Mathematica [A]
time = 0.17, size = 181, normalized size = 1.29

$$\frac{gi\left(-a^2Bd^2(3bc+ad)\log(a+bx)+b\left(dx(a^2Bd^2-b^2Bc(c+dx)+Ab^2dx(3c+2dx)+abd(6Ac+3Adx+Bdx))+Bd^2(6a^2c+3abx(2c+dx)+b^2x^2(3c+2dx))\log\left(\frac{e(a+bx)}{c+dx}\right)+Bc(b^2c^2-3abcd+6a^2d^2)\log(c+dx)\right)\right)}{6b^2d^2}$$

Antiderivative was successfully verified.

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

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 2139 vs. $2(132) = 264$.
time = 0.47, size = 2140, normalized size = 15.29

method	result
risch	$\frac{giBx\left(2bd\,x^{2}+3xad+3bcx+6ca\right)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{6}+\frac{igbdA\,x^{3}}{3}+\frac{igdAa\,x^{2}}{2}+\frac{igbAc\,x^{2}}{2}+\frac{igdBa\,x^{2}}{6}-\frac{igbBc\,x^{2}}{6}+i$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 363 vs. $2(130) = 260$.
time = 0.29, size = 363, normalized size = 2.59

$$\frac{1}{3}i\,Abdgx^3+\frac{1}{2}i\,Abcgx^2+\frac{1}{2}i\,Aadgx^2+i\left(x\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log\left(bx+a\right)}{b}-\frac{c\log\left(dx+c\right)}{d}\right)Bacg+\frac{1}{2}i\left(x^2\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)-\frac{a^2\log\left(bx+a\right)}{b^2}+\frac{c^2\log\left(dx+c\right)}{d^2}-\frac{(bc-ad)x}{bd}\right)Bbcg+\frac{1}{2}i\left(x^2\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)-\frac{a^2\log\left(bx+a\right)}{b^2}+\frac{c^2\log\left(dx+c\right)}{d^2}-\frac{(bc-ad)x}{bd}\right)Badg+\frac{1}{6}i\left(2\,x^3\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)+\frac{2\,a^3\log\left(bx+a\right)}{b^3}-\frac{2\,c^3\log\left(dx+c\right)}{d^3}-\frac{(b^2cd-abd^2)x^2-2\,(b^2c^2-a^2d^2)x}{b^2d^2}\right)Bbdg+i\,Aacgx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [**A**]
time = 0.39, size = 230, normalized size = 1.64

$$\frac{2i\,Ab^3d^3gx^3+((3i\,A-i\,B)b^3cd^2+(3i\,A+i\,B)ab^2d^3)gx^2+(-i\,Bb^3c^2d+6i\,Aab^2cd^2+i\,Ba^2bd^3)gx+(3i\,Ba^2bcd^2-i\,Ba^3d^3)g\log\left(\frac{bx+a}{b}\right)+(i\,Bb^3c^3-3i\,Bab^2c^2d)g\log\left(\frac{dx+c}{d}\right)+(2i\,Bb^3d^3gx^3+6i\,Bab^2cd^2gx-3\,(-i\,Bb^3cd^2-i\,Bab^2d^3)gx^2)\log\left(\frac{(bx+a)e}{dx+c}\right)}{6\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 498 vs. $2(126) = 252$.
time = 1.66, size = 498, normalized size = 3.56

$$\frac{Abdgix^3}{3}-\frac{Ba^2gi(ad-3bc)\log\left(x+\frac{Ba^3cd^2gi+\frac{Ba^3d^2gi(ad-3bc)}{b}-6Ba^2bc^2dgi-Ba^2cdgi(ad-3bc)+Bab^2c^3gi}{Ba^3d^3gi-3Ba^2bcd^2gi-3Bab^2c^2dgi+Bb^3c^3gi}\right)}{6b^2}-\frac{Bc^2gi(3ad-bc)\log\left(x+\frac{Ba^3cd^2gi-6Ba^2bc^2dgi+Bab^2c^3gi+Babc^2gi(3ad-bc)-\frac{Bb^2c^3gi(3ad-bc)}{d}}{Ba^3d^3gi-3Ba^2bcd^2gi-3Bab^2c^2dgi+Bb^3c^3gi}\right)}{6d^2}+x^2\left(\frac{Aadgi}{2}+\frac{Abcgi}{2}+\frac{Badgi}{6}-\frac{Bbcgi}{6}\right)+x\left(Aacgi+\frac{Ba^2dgi}{6b}-\frac{Bbc^2gi}{6d}\right)+\left(Bacgix+\frac{Badgix^2}{2}+\frac{Bbcgix^2}{2}+\frac{Bbdgix^3}{3}\right)\log\left(\frac{e(a+bx)}{c+dx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2362 vs. 2(130) = 260.
time = 4.10, size = 2362, normalized size = 16.87

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*(-I*B*b^7*c^4*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 4*I*B*a*b^6
*c^3*d*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 6*I*B*a^2*b^5*c^2*d^2*
g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 4*I*B*a^3*b^4*c*d^3*g*e^4*log
(-b*e + (b*x*e + a*e)*d/(d*x + c)) - I*B*a^4*b^3*d^4*g*e^4*log(-b*e + (b*x*
e + a*e)*d/(d*x + c)) + 3*I*(b*x*e + a*e)*B*b^6*c^4*d*g*e^3*log(-b*e + (b*x
*e + a*e)*d/(d*x + c))/(d*x + c) - 12*I*(b*x*e + a*e)*B*a*b^5*c^3*d^2*g*e^3
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 18*I*(b*x*e + a*e)*B*a^2
*b^4*c^2*d^3*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 12*I*(
b*x*e + a*e)*B*a^3*b^3*c*d^4*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c) + 3*I*(b*x*e + a*e)*B*a^4*b^2*d^5*g*e^3*log(-b*e + (b*x*e + a*e)*d/
(d*x + c))/(d*x + c) - 3*I*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g*e^2*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 12*I*(b*x*e + a*e)^2*B*a*b^4*c^3*d^
3*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 18*I*(b*x*e + a
*e)^2*B*a^2*b^3*c^2*d^4*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x +
c)^2 + 12*I*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*g*e^2*log(-b*e + (b*x*e + a*e)*
d/(d*x + c))/(d*x + c)^2 - 3*I*(b*x*e + a*e)^2*B*a^4*b*d^6*g*e^2*log(-b*e +
 (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + I*(b*x*e + a*e)^3*B*b^4*c^4*d^3*g
*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 4*I*(b*x*e + a*e)^3*
B*a*b^3*c^3*d^4*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 6*I
*(b*x*e + a*e)^3*B*a^2*b^2*c^2*d^5*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c)
```

```
)/(d*x + c)^3 - 4*I*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g*e*log(-b*e + (b*x*e + a
*e)*d/(d*x + c))/(d*x + c)^3 + I*(b*x*e + a*e)^3*B*a^4*d^7*g*e*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 3*I*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g
*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 12*I*(b*x*e + a*e)^2*B*a*b^
4*c^3*d^3*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 18*I*(b*x*e + a*
e)^2*B*a^2*b^3*c^2*d^4*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 12*
I*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x +
 c)^2 + 3*I*(b*x*e + a*e)^2*B*a^4*b*d^6*g*e^2*log((b*x*e + a*e)/(d*x + c))/
(d*x + c)^2 - I*(b*x*e + a*e)^3*B*b^4*c^4*d^3*g*e*log((b*x*e + a*e)/(d*x +
c))/(d*x + c)^3 + 4*I*(b*x*e + a*e)^3*B*a*b^3*c^3*d^4*g*e*log((b*x*e + a*e)
/(d*x + c))/(d*x + c)^3 - 6*I*(b*x*e + a*e)^3*B*a^2*b^2*c^2*d^5*g*e*log((b*
x*e + a*e)/(d*x + c))/(d*x + c)^3 + 4*I*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g*e*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - I*(b*x*e + a*e)^3*B*a^4*d^7*g*e*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - I*A*b^7*c^4*g*e^4 + 4*I*A*a*b^6*c
^3*d*g*e^4 - 6*I*A*a^2*b^5*c^2*d^2*g*e^4 + 4*I*A*a^3*b^4*c*d^3*g*e^4 - I*A*
a^4*b^3*d^4*g*e^4 + 3*I*(b*x*e + a*e)*A*b^6*c^4*d*g*e^3/(d*x + c) - I*(b*x*
e + a*e)*B*b^6*c^4*d*g*e^3/(d*x + c) - 12*I*(b*x*e + a*e)*A*a*b^5*c^3*d^2*g
*e^3/(d*x + c) + 4*I*(b*x*e + a*e)*B*a*b^5*c^3*d^2*g*e^3/(d*x + c) + 18*I*(
b*x*e + a*e)*A*a^2*b^4*c^2*d^3*g*e^3/(d*x + c) - 6*I*(b*x*e + a*e)*B*a^2*b^
4*c^2*d^3*g*e^3/(d*x + c) - 12*I*(b*x*e + a*e)*A*a^3*b^3*c*d^4*g*e^3/(d*x +
 c) + 4*I*(b*x*e + a*e)*B*a^3*b^3*c*d^4*g*e^3/(d*x + c) + 3*I*(b*x*e + a*e)
*A*a^4*b^2*d^5*g*e^3/(d*x + c) - I*(b*x*e + a*e)*B*a^4*b^2*d^5*g*e^3/(d*x +
 c) + I*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g*e^2/(d*x + c)^2 - 4*I*(b*x*e + a*e)
^2*B*a*b^4*c^3*d^3*g*e^2/(d*x + c)^2 + 6*I*(b*x*e + a*e)^2*B*a^2*b^3*c^2*d^
4*g*e^2/(d*x + c)^2 - 4*I*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*g*e^2/(d*x + c)^2
 + I*(b*x*e + a*e)^2*B*a^4*b*d^6*g*e^2/(d*x + c)^2)*(b*c/((b*c*e - a*d*e)*(
b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b^5*d^2*e^3 - 3*(b*x*e +
a*e)*b^4*d^3*e^2/(d*x + c) + 3*(b*x*e + a*e)^2*b^3*d^4*e/(d*x + c)^2 - (b*x
*e + a*e)^3*b^2*d^5/(d*x + c)^3)
```

Mupad [B]
time = 4.71, size = 282, normalized size = 2.01

$$x^2\left(\frac{g\,i\,(6\,A\,a\,d+6\,A\,b\,c+B\,a\,d-B\,b\,c)}{6}-\frac{A\,g\,i\,(6\,a\,d+6\,b\,c)}{12}\right)-x\left(\frac{\left(\frac{g\,i\,(6\,A\,a\,d+6\,A\,b\,c+B\,a\,d-B\,b\,c)}{3}-\frac{A\,g\,i\,(6\,a\,d+6\,b\,c)}{6}\right)\,(6\,a\,d+6\,b\,c)}{6\,b\,d}+A\,a\,c\,g\,i-\frac{g\,i\,(2\,A\,a^2\,d^2+2\,A\,b^2\,c^2+B\,a^2\,d^2-B\,b^2\,c^2+8\,A\,a\,b\,c\,d)}{2\,b\,d}\right)+\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\,\left(\frac{B\,b\,d\,g\,i\,x^3}{3}+\frac{B\,g\,i\,(a\,d+b\,c)\,x^2}{2}+B\,a\,c\,g\,i\,x\right)-\frac{\ln(a+b\,x)\,(B\,a^3\,d\,g\,i-3\,B\,a^2\,b\,c\,g\,i)}{6\,b^2}+\frac{\ln(c+d\,x)\,(B\,b\,c^3\,g\,i-3\,B\,a\,c^2\,d\,g\,i)}{6\,d^2}+\frac{A\,b\,d\,g\,i\,x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=81

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

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

Rubi [A]
time = 0.04, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}=0.107$, Rules used = {2548, 21, 45}

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

Antiderivative was successfully verified.

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

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

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

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

Rule 2548

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*(
(A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*(m + 1))), x] - Dist[B*n*((b*c
- a*d)/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /;
 FreeQ[{a, b, c, d, e, f, g, A, B, m, n}, x] && EqQ[n + mn, 0] && NeQ[b*c -
```

```
a*d, 0] && NeQ[m, -1] &&  !(EqQ[m, -2] && IntegerQ[n])
```

Rubi steps

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

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

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

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

Mathematica [A]
time = 0.02, size = 70, normalized size = 0.86

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

Antiderivative was successfully verified.

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 664 vs. 2(75) = 150.
time = 0.42, size = 665, normalized size = 8.21

method	result
risch	$\frac{iBx(dx+2c)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2}+\frac{idAx^2}{2}+iAcx-\frac{idB\ln(bx+a)a^2}{2b^2}+\frac{iB\ln(bx+a)ac}{b}-\frac{Bc^2i\ln(-dx-c)}{2d}+\frac{idBax}{2b}$
derivativedivides	$-\frac{e(ad-cb)\left(-\frac{Adei(ad-cb)}{2\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)^2}-\frac{Bd^2i\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)a}{2eb^2}+\frac{Bdi\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)c}{2eb}+\frac{B\cdots}{2b\left(be-\left(\frac{be}{d}\cdots\right.\right.}\right.}{}$
default	$-\frac{e(ad-cb)\left(-\frac{Adei(ad-cb)}{2\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)^2}-\frac{Bd^2i\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)a}{2eb^2}+\frac{Bdi\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)c}{2eb}+\frac{B\cdots}{2b\left(be-\left(\frac{be}{d}\cdots\right.\right.}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A]
time = 0.28, size = 146, normalized size = 1.80

$$\frac{1}{2}i\,Adx^2 + i\left(x\log\left(\frac{bxe}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log\left(bx+a\right)}{b} - \frac{c\log\left(dx+c\right)}{d}\right)Bc + \frac{1}{2}i\left(x^2\log\left(\frac{bxe}{dx+c} + \frac{ae}{dx+c}\right) - \frac{a^2\log\left(bx+a\right)}{b^2} + \frac{c^2\log\left(dx+c\right)}{d^2} - \frac{(bc-ad)x}{bd}\right)Bd + i\,Acx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A]
time = 0.39, size = 131, normalized size = 1.62

$$\frac{i\,Ab^2d^2x^2 - i\,Bb^2c^2\log\left(\frac{dx+c}{d}\right) + ((2i\,A - i\,B)b^2cd + i\,Babd^2)x + (i\,Bb^2d^2x^2 + 2i\,Bb^2cdx)\log\left(\frac{(bx+a)e}{dx+c}\right) + (2i\,Babcd - i\,Ba^2d^2)\log\left(\frac{bx+a}{b}\right)}{2\,b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 253 vs. $2(68) = 136$.
time = 1.03, size = 253, normalized size = 3.12

$$\frac{Adix^2}{2} - \frac{Bai(ad-2bc)\log\left(x + \frac{Ba^2cdi + \frac{Ba^2di(ad-2bc)}{b} - 3Babc^2i - Baci(ad-2bc)}{Ba^2d^2i - 2Babcdi - Bb^2c^2i}\right)}{2b^2} - \frac{Bc^2i\log\left(x + \frac{Ba^2cdi - 2Babc^2i - \frac{Bb^2c^3i}{d}}{Ba^2d^2i - 2Babcdi - Bb^2c^2i}\right)}{2d} + x\left(Aci + \frac{Badi}{2b} - \frac{Bci}{2}\right) + \left(Bcix + \frac{Bdix^2}{2}\right)\log\left(\frac{e(a+bx)}{c+dx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1369 vs. 2(73) = 146.
time = 3.49, size = 1369, normalized size = 16.90

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
 a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b^4*d*e^2 - 2*(b*x*e + a*e)*b^
3*d^2*e/(d*x + c) + (b*x*e + a*e)^2*b^2*d^3/(d*x + c)^2)
```

Mupad [B]
time = 4.64, size = 126, normalized size = 1.56

$$x\left(\frac{i\,(2\,A\,a\,d+4\,A\,b\,c+B\,a\,d-B\,b\,c)}{2\,b}-\frac{A\,i\,(2\,a\,d+2\,b\,c)}{2\,b}\right)+\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\,\left(\frac{B\,d\,i\,x^2}{2}+B\,c\,i\,x\right)-\frac{\ln(a+b\,x)\,\left(B\,a^2\,d\,i-2\,B\,a\,b\,c\,i\right)}{2\,b^2}+\frac{A\,d\,i\,x^2}{2}-\frac{B\,c^2\,i\,\ln(c+d\,x)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=133

$$\frac{i(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg}-\frac{(bc-ad)i\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(A-B+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g}+\frac{B(bc-ad)i\mathrm{Li}_2\left(1\right.}{b^2g}$$

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

Rubi [A]
time = 0.20, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2560, 2542, 2458, 2378, 2370, 2352}

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

Antiderivative was successfully verified.

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

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

Rule 2352

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[(-e^(-1))*PolyLo
g[2, 1 - c*x], x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2370

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2378

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2458

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[(g*(x/e))^q*((e*h - d*i)/e + i*(x/e))^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2542

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

Rule 2560

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_)), x_Symbol] :> Sim
p[(f + g*x)^(m + 1)*(h + i*x)*((A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*
(m + 2))), x] + Dist[i*((b*c - a*d)/(b*d*(m + 2))), Int[(f + g*x)^m*(A - B*
n + B*Log[e*((a + b*x)^n/(c + d*x)^n)]), x], x] /; FreeQ[{a, b, c, d, e, f,
 g, h, i, A, B, m, n}, x] && EqQ[n + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d,
 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && IGtQ[m, -2]
```

Rubi steps

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

Mathematica [A]
time = 0.08, size = 164, normalized size = 1.23

$$\frac{i\left(\left(-bBc+aBd\right)\log^2(a+bx)+2\left(Abdx+Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+(-bBc+aBd)\log(c+dx)\right)+2(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)+B\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2B(bc-ad)\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)}{2b^2g}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 505 vs. $2(132) = 264$.
time = 1.30, size = 506, normalized size = 3.80

method	result
derivativedivides	$-\frac{e(ad-cb)\left(\frac{i\,d^2 A}{gb\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}-\frac{i\,d^2 A\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{eg\,b^2}+\frac{i\,d^2 A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{eg\,b^2}-\frac{i\,d^2 B\,\mathrm{dilog}\left(-\frac{-be+(}{}\right.}{eg\,b}\right.}{}$
default	$-\frac{e(ad-cb)\left(\frac{i\,d^2 A}{gb\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}-\frac{i\,d^2 A\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{eg\,b^2}+\frac{i\,d^2 A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{eg\,b^2}-\frac{i\,d^2 B\,\mathrm{dilog}\left(-\frac{-be+(}{}\right.}{eg\,b}\right.}{}$
risch	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A]
time = 0.34, size = 219, normalized size = 1.65

$$i\,Ad\left(\frac{x}{bg}-\frac{a\log\left(bx+a\right)}{b^2g}\right)+\frac{i\,Ac\log\left(bgx+ag\right)}{bg}-\frac{i\,Bc\log\left(dx+c\right)}{bg}-\frac{\left(-i\,bc+i\,ad\right)\left(\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{b^2g}+\frac{2i\,Bbdx+\left(i\,bc-i\,ad\right)B\log\left(bx+a\right)^2-2\left(-i\,Bbdx-i\,Bbc\right)\log\left(bx+a\right)-2\left(i\,Bbdx+\left(i\,bc-i\,ad\right)B\log\left(bx+a\right)\right)\log\left(dx+c\right)}{2\,b^2g}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{i\left(\int \frac{Ac}{a+bx}\,dx + \int \frac{Adx}{a+bx}\,dx + \int \frac{Bc\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx + \int \frac{Bdx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(c\,i+d\,i\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=142

$$-\frac{Bi(c+dx)}{bg^2(a+bx)}-\frac{i(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)}-\frac{di\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2}+\frac{Bdi\text{Li}_2\left(\frac{b(c+}{d(a+}\right.}{b^2g^2}$$

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

Rubi [A]
time = 0.13, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.132$, Rules used = {2562, 2380, 2341, 2379, 2438}

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

Antiderivative was successfully verified.

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

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

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2379

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

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
```

```
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

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

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

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

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

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

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

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

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

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

Mathematica [A]
time = 0.11, size = 175, normalized size = 1.23

$$\frac{i\left(-2(A+B)(bc-ad)-Bd(a+bx)\log^2(a+bx)+2(-bBc+aBd)\log\left(\frac{e(a+bx)}{c+dx}\right)+2Bd(a+bx)\log(c+dx)+2d(a+bx)\log(a+bx)\left(A-B+B\log\left(\frac{e(a+bx)}{c+dx}\right)+B\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2Bd(a+bx)\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)}{2b^2g^2(a+bx)}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 530 vs. $2(142) = 284$.
time = 1.23, size = 531, normalized size = 3.74 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(c\,i+d\,i\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{{(a\,g+b\,g\,x)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=85

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

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

Rubi [A]
time = 0.05, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$, Rules used = {2562, 2341}

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

Antiderivative was successfully verified.

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

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

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

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

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

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

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

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

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

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 208 vs. 2(85) = 170.
time = 0.11, size = 208, normalized size = 2.45

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

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 176 vs. 2(81) = 162.
time = 0.46, size = 177, normalized size = 2.08

method	result

norman	$\frac{\frac{Bcdix\ln\left(\frac{e(bx+a)}{dx+c}\right)}{g(ad-cb)}-\frac{2Aadi+2Abci+Badi+Bbci}{4g\,b^{2}}-\frac{(2Adi+Bdi)x}{2gb}+\frac{Bi\,c^{2}\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2g(ad-cb)}+\frac{B\,d^{2}i\,x^{2}\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2(ad-cb)g}}{g^{2}(bx+a)^{2}}$
derivativedivides	$-\frac{e(ad-cb)\left(-\frac{i\,d^{2}eA}{2(ad-cb)^{2}g^{3}\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}+\frac{i\,d^{2}eB\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}-\frac{1}{4\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}\right)}{(ad-cb)^{2}g^{3}}\right)}{d^{2}}$
default	$-\frac{e(ad-cb)\left(-\frac{i\,d^{2}eA}{2(ad-cb)^{2}g^{3}\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}+\frac{i\,d^{2}eB\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}-\frac{1}{4\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}\right)}{(ad-cb)^{2}g^{3}}\right)}{d^{2}}$
risch	$-\frac{Bi(2bdx+ad+cb)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2(bx+a)^{2}b^{2}g^{3}}-\frac{i(2B\ln(dx+c)b^{2}d^{2}x^{2}-2B\ln(-bx-a)b^{2}d^{2}x^{2}+4B\ln(dx+c)ab\,d^{2}x-4B\ln(-bx-a)a}{}$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 570 vs. $2(80) = 160$.
time = 0.28, size = 570, normalized size = 6.71

$$-\frac{1}{4}i\,Bd\left(\frac{2\,(2\,bx+a)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)}{b^4g^3x^2+2\,ab^3g^3x+a^2b^2g^3}+\frac{3\,abc-a^2d+2\,(2\,b^2c-abd)x}{(b^5c-ab^4d)g^3x^2+2\,(ab^4c-a^2b^3d)g^3x+(a^2b^3c-a^3b^2d)g^3}+\frac{2\,(2\,bcd-ad^2)\log(bx+a)}{(b^4c^2-2\,ab^3cd+a^2b^2d^2)g^3}-\frac{2\,(2\,bcd-ad^2)\log(dx+c)}{(b^4c^2-2\,ab^3cd+a^2b^2d^2)g^3}\right)+\frac{1}{4}i\,Bc\left(\frac{2\,bdx-bc+3\,ad}{(b^4c-ab^3d)g^3x^2+2\,(ab^3c-a^2b^2d)g^3x+(a^2b^2c-a^3bd)g^3}-\frac{2\,\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)}{b^3g^3x^2+2\,ab^2g^3x+a^2bg^3}+\frac{2\,d^2\log(bx+a)}{(b^3c^2-2\,ab^2cd+a^2bd^2)g^3}-\frac{2\,d^2\log(dx+c)}{(b^3c^2-2\,ab^2cd+a^2bd^2)g^3}\right)-\frac{i\,(2\,bx+a)Ad}{2\,(b^4g^3x^2+2\,ab^3g^3x+a^2b^2g^3)}-\frac{i\,Ac}{2\,(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*I*(2*b*x
+ a)*A*d/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*I*A*c/(b^3*g^3*x
^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 177 vs. $2(80) = 160$.
time = 0.39, size = 177, normalized size = 2.08

$$-\frac{(2i\,A+i\,B)b^2c^2+(-2i\,A-i\,B)a^2d^2-2\left((-2i\,A-i\,B)b^2cd+(2i\,A+i\,B)abd^2\right)x-2\left(-i\,Bb^2d^2x^2-2i\,Bb^2cdx-i\,Bb^2c^2\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4\left((b^5c-ab^4d)g^3x^2+2\left(ab^4c-a^2b^3d\right)g^3x+\left(a^2b^3c-a^3b^2d\right)g^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 384 vs. $2(73) = 146$.
time = 2.83, size = 384, normalized size = 4.52

$$-\frac{Bd^2i\log\left(x+\frac{-\frac{Ba^2d^4i}{ad-bc}+\frac{2Babcd^3i}{ad-bc}+Bad^3i-\frac{Bb^2c^2d^2i}{ad-bc}+Bbcd^2i}{2Bbd^3i}\right)}{2b^2g^3\,(ad-bc)}+\frac{Bd^2i\log\left(x+\frac{\frac{Ba^2d^4i}{ad-bc}-\frac{2Babcd^3i}{ad-bc}+Bad^3i+\frac{Bb^2c^2d^2i}{ad-bc}+Bbcd^2i}{2Bbd^3i}\right)}{2b^2g^3\,(ad-bc)}+\frac{-2Aadi-2Abci-Badi-Bbci+x(-4Abdi-2Bbdi)}{4a^2b^2g^3+8ab^3g^3x+4b^4g^3x^2}+\frac{(-Badi-Bbci-2Bbdix)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2a^2b^2g^3+4ab^3g^3x+2b^4g^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [A]
time = 2.85, size = 115, normalized size = 1.35

$$\frac{\left(-2i\,Be^3\log\left(\frac{bxe+ae}{dx+c}\right)-2i\,Ae^3-i\,Be^3\right)(dx+c)^2\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{4\,(bxe+ae)^2g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [B]
time = 5.58, size = 197, normalized size = 2.32

$$-\frac{x\,\left(2\,A\,b\,d\,i+B\,b\,d\,i\right)+A\,a\,d\,i+A\,b\,c\,i+\frac{B\,a\,d\,i}{2}+\frac{B\,b\,c\,i}{2}}{2\,a^2\,b^2\,g^3+4\,a\,b^3\,g^3\,x+2\,b^4\,g^3\,x^2}-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\,\left(\frac{B\,c\,i}{2\,b^2\,g^3}+\frac{B\,a\,d\,i}{2\,b^3\,g^3}+\frac{B\,d\,i\,x}{b^2\,g^3}\right)}{2\,a\,x+b\,x^2+\frac{a^2}{b}}-\frac{B\,d^2\,i\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,1\mathrm{i}}{b^2\,g^3\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=173

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

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

Rubi [A]

time = 0.09, antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2562, 45, 2372, 12}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 45

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

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
```

```
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

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

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

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

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

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

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

Mathematica [A]
time = 0.27, size = 187, normalized size = 1.08

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

Antiderivative was successfully verified.

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

```
[Out] -1/36*(i*((12*A*b*c)/(a + b*x)^3 + (4*b*B*c)/(a + b*x)^3 - (12*a*A*d)/(a +
b*x)^3 - (4*a*B*d)/(a + b*x)^3 + (18*A*d)/(a + b*x)^2 + (3*B*d)/(a + b*x)^2
 - (6*B*d^2)/((b*c - a*d)*(a + b*x)) - (6*B*d^3*Log[a + b*x])/(b*c - a*d)^2
 + (6*B*(2*b*c + a*d + 3*b*d*x)*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^3 +
 (6*B*d^3*Log[c + d*x])/(b*c - a*d)^2))/(b^2*g^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 344 vs. $2(165) = 330$.
time = 0.54, size = 345, normalized size = 1.99

method	result
derivativedivides	$-\frac{e(ad-cb)\left(\frac{i d^2 e^2 A b}{3(ad-cb)^3 g^4 \left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}-\frac{i d^3 e A}{2(ad-cb)^3 g^4\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}-\frac{i d^2 e^2 B b\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{3\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}-\frac{1}{9\left(\frac{be}{d}+\frac{(ad-\cdots}{d(dx\cdots}\right)}\cdots\right)}{(ad-cb)^3 g^4}\cdots\right)}{d^2}$
default	$-\frac{e(ad-cb)\left(\frac{i d^2 e^2 A b}{3(ad-cb)^3 g^4 \left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}-\frac{i d^3 e A}{2(ad-cb)^3 g^4\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}-\frac{i d^2 e^2 B b\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{3\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}-\frac{1}{9\left(\frac{be}{d}+\frac{(ad-\cdots}{d(dx\cdots}\right)}\cdots\right)}{(ad-cb)^3 g^4}\cdots\right)}{d^2}$
norman	$\frac{-\frac{6Aa^2d^2i+6Aabcdi-12Ab^2c^2i+3Ba^2d^2i+5Babcdi-4Bb^2c^2i}{36b^2g(ad-cb)}-\frac{\left(6Aad^2i-6Abcdi+3Bad^2i-Bbcdi\right)x}{12g(ad-cb)b}+\frac{Bd^2ibx^3}{18a(ad-cb)g}+\frac{Bic^2(3ac\cdots}{6\left(a^2d\cdots\right.}\cdots}{g^3(bx+a)^3}$
risch	$-\frac{Bi(3bdx+ad+2cb)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{6(bx+a)^3b^2g^4}-\frac{(6B\ln(dx+c)b^3d^3x^3-6B\ln(-bx-a)b^3d^3x^3+18B\ln(dx+c)ab^2d^3x^2-18B\ln(-\cdots}{\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 933 vs. $2(163) = 326$.
time = 0.32, size = 933, normalized size = 5.39

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

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

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

<u>**Fricas**</u> [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 361 vs. $2(163) = 326$.
time = 0.39, size = 361, normalized size = 2.09

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(4*(3*I*A + I*B)*b^3*c^3 + 9*(-2*I*A - I*B)*a*b^2*c^2*d - (-6*I*A - 5
*I*B)*a^3*d^3 + 6*(-I*B*b^3*c*d^2 + I*B*a*b^2*d^3)*x^2 + 3*((6*I*A + I*B)*b
^3*c^2*d + 6*(-2*I*A - I*B)*a*b^2*c*d^2 + (6*I*A + 5*I*B)*a^2*b*d^3)*x + 6*
(-I*B*b^3*d^3*x^3 - 3*I*B*a*b^2*d^3*x^2 + 2*I*B*b^3*c^3 - 3*I*B*a*b^2*c^2*d
 + 3*(I*B*b^3*c^2*d - 2*I*B*a*b^2*c*d^2)*x)*log((b*x + a)*e/(d*x + c)))/((b
^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d
+ a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*
x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4)
```

<u>**Sympy**</u> [**B**] Leaf count of result is larger than twice the leaf count of optimal. 629 vs. $2(158) = 316$.
time = 5.08, size = 629, normalized size = 3.64

$$-\frac{Bd^{3}i\log\left(x+\frac{-\frac{Ba^{3}d^{6}i}{(ad-bc)^{2}}+\frac{3Ba^{2}bcd^{5}i}{(ad-bc)^{2}}-\frac{3Bab^{2}c^{2}d^{4}i}{(ad-bc)^{2}}+Bad^{4}i+\frac{Bb^{3}c^{3}d^{3}i}{(ad-bc)^{2}}+Bbcd^{3}i}{2Bbd^{4}i}\right)}{6b^{2}g^{4}\left(ad-bc\right)^{2}}+\frac{Bd^{3}i\log\left(x+\frac{\frac{Ba^{3}d^{6}i}{(ad-bc)^{2}}-\frac{3Ba^{2}bcd^{5}i}{(ad-bc)^{2}}+\frac{3Bab^{2}c^{2}d^{4}i}{(ad-bc)^{2}}+Bad^{4}i-\frac{Bb^{3}c^{3}d^{3}i}{(ad-bc)^{2}}+Bbcd^{3}i}{2Bbd^{4}i}\right)}{6b^{2}g^{4}\left(ad-bc\right)^{2}}+\frac{(-Badi-2Bbci-3Bbdix)\log\left(\frac{e(a+bx)}{c+dx}\right)}{6a^{3}b^{2}g^{4}+18a^{2}b^{3}g^{4}x+18ab^{4}g^{4}x^{2}+6b^{5}g^{4}x^{3}}+\frac{-6Aa^{2}d^{2}i-6Aabcdi+12Ab^{2}c^{2}i-5Ba^{2}d^{2}i-5Babcdi+4Bb^{2}c^{2}i-6Bb^{2}d^{2}ix^{2}+x(-18Aabd^{2}i+18Ab^{2}cdi-15Babd^{2}i+3Bb^{2}cdi)}{36a^{4}b^{2}dg^{4}-36a^{3}b^{3}cg^{4}+x^{3}\cdot(36ab^{5}dg^{4}-36b^{6}cg^{4})+x^{2}\cdot(108a^{2}b^{4}dg^{4}-108ab^{5}cg^{4})+x\left(108a^{3}b^{3}dg^{4}-108a^{2}b^{4}cg^{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [A]
time = 4.47, size = 238, normalized size = 1.38

$$-\frac{\left(12i\,Bbe^4\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{18i\,(bxe+ae)Bde^3\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+12i\,Abe^4+4i\,Bbe^4-\frac{18i\,(bxe+ae)Ade^3}{dx+c}-\frac{9i\,(bxe+ae)Bde^3}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{36\left(\frac{(bxe+ae)^3bcg^4}{(dx+c)^3}-\frac{(bxe+ae)^3adg^4}{(dx+c)^3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(12*I*B*b*e^4*log((b*x*e + a*e)/(d*x + c)) - 18*I*(b*x*e + a*e)*B*d*e
^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 12*I*A*b*e^4 + 4*I*B*b*e^4 - 18
*I*(b*x*e + a*e)*A*d*e^3/(d*x + c) - 9*I*(b*x*e + a*e)*B*d*e^3/(d*x + c))*(
b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*
x*e + a*e)^3*b*c*g^4/(d*x + c)^3 - (b*x*e + a*e)^3*a*d*g^4/(d*x + c)^3)
```

Mupad [B]
time = 5.87, size = 361, normalized size = 2.09

$$-\frac{\frac{6\,A\,a^2\,d^2\,i-12\,A\,b^2\,c^2\,i+5\,B\,a^2\,d^2\,i-4\,B\,b^2\,c^2\,i+6\,A\,a\,b\,c\,d\,i+5\,B\,a\,b\,c\,d\,i}{6\,(a\,d-b\,c)}+\frac{x\,(6\,A\,a\,b\,d^2\,i+5\,B\,a\,b\,d^2\,i-6\,A\,b^2\,c\,d\,i-B\,b^2\,c\,d\,i)}{2\,(a\,d-b\,c)}+\frac{B\,b^2\,d^2\,i\,x^2}{a\,d-b\,c}}{6\,a^3\,b^2\,g^4+18\,a^2\,b^3\,g^4\,x+18\,a\,b^4\,g^4\,x^2+6\,b^5\,g^4\,x^3}-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\,\left(\frac{B\,c\,i}{3\,b^2\,g^4}+\frac{B\,a\,d\,i}{6\,b^3\,g^4}+\frac{B\,d\,i\,x}{2\,b^2\,g^4}\right)}{3\,a^2\,x+\frac{a^3}{b}+b^2\,x^3+3\,a\,b\,x^2}-\frac{B\,d^3\,i\,\mathrm{atanh}\left(\frac{6\,b^4\,c^2\,g^4-6\,a^2\,b^2\,d^2\,g^4}{6\,b^2\,g^4\,(a\,d-b\,c)^2}-\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{3\,b^2\,g^4\,(a\,d-b\,c)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
- b*c))/(6*a^3*b^2*g^4 + 6*b^5*g^4*x^3 + 18*a^2*b^3*g^4*x + 18*a*b^4*g^4*x^
2) - (log((e*(a + b*x))/(c + d*x))*((B*c*i)/(3*b^2*g^4) + (B*a*d*i)/(6*b^3*
g^4) + (B*d*i*x)/(2*b^2*g^4)))/(3*a^2*x + a^3/b + b^2*x^3 + 3*a*b*x^2) - (B
*d^3*i*atanh((6*b^4*c^2*g^4 - 6*a^2*b^2*d^2*g^4)/(6*b^2*g^4*(a*d - b*c)^2)
- (2*b*d*x)/(a*d - b*c)))/(3*b^2*g^4*(a*d - b*c)^2)
```

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

Optimal. Leaf size=269

$$-\frac{Bd^2i(c+dx)^2}{4(bc-ad)^3g^5(a+bx)^2}+\frac{2bBdi(c+dx)^3}{9(bc-ad)^3g^5(a+bx)^3}-\frac{b^2Bi(c+dx)^4}{16(bc-ad)^3g^5(a+bx)^4}-\frac{d^2i(c+dx)^2\left(A+B\log\left(\frac{e(a}{c-}\right.\right.}{2(bc-ad)^3g^5(a+bx)^2}$$

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

Rubi [A]
time = 0.12, antiderivative size = 269, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.132$, Rules used = {2562, 45, 2372, 12, 14}

$$-\frac{b^2i(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^3}-\frac{d^2i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^5(a+bx)^2(bc-ad)^3}+\frac{2bdi(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^3}-\frac{b^2Bi(c+dx)^4}{16g^5(a+bx)^4(bc-ad)^3}-\frac{Bd^2i(c+dx)^2}{4g^5(a+bx)^2(bc-ad)^3}+\frac{2bBdi(c+dx)^3}{9g^5(a+bx)^3(bc-ad)^3}$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

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

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

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

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

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

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

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

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

Mathematica [**A**]
time = 0.31, size = 210, normalized size = 0.78

$$-\frac{i\left(\frac{36Abc}{(a+bx)^4}+\frac{9bBc}{(a+bx)^4}-\frac{36aAd}{(a+bx)^4}-\frac{9aBd}{(a+bx)^4}+\frac{48Ad}{(a+bx)^3}+\frac{4Bd}{(a+bx)^3}-\frac{6Bd^2}{(bc-ad)(a+bx)^2}+\frac{12Bd^3}{(bc-ad)^2(a+bx)}+\frac{12Bd^4\log(a+bx)}{(bc-ad)^3}+\frac{12B(3bc+ad+4bdx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}-\frac{12Bd^4\log(c+dx)}{(bc-ad)^3}\right)}{144b^2g^5}$$

Antiderivative was successfully verified.

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

```
[Out] -1/144*(i*((36*A*b*c)/(a + b*x)^4 + (9*b*B*c)/(a + b*x)^4 - (36*a*A*d)/(a +
 b*x)^4 - (9*a*B*d)/(a + b*x)^4 + (48*A*d)/(a + b*x)^3 + (4*B*d)/(a + b*x)^
3 - (6*B*d^2)/((b*c - a*d)*(a + b*x)^2) + (12*B*d^3)/((b*c - a*d)^2*(a + b*
x)) + (12*B*d^4*Log[a + b*x])/(b*c - a*d)^3 + (12*B*(3*b*c + a*d + 4*b*d*x)
*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^4 - (12*B*d^4*Log[c + d*x])/(b*c -
 a*d)^3))/(b^2*g^5)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 515 vs. 2(257) = 514.
time = 0.58, size = 516, normalized size = 1.92 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1386 vs. 2(254) = 508.
time = 0.37, size = 1386, normalized size = 5.15

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/144*I*B*d*(12*(4*b*x + a)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^6*g^5*
x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5)
```

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

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 603 vs. $2(254) = 508$.
time = 0.38, size = 603, normalized size = 2.24

$$\frac{9\,(-4i\,A-i\,B)b^4c^4+32\,(3i\,A+i\,B)ab^3c^3d+36\,(-2i\,A-i\,B)a^2b^2c^2d^2-(-12i\,A-13i\,B)a^4d^4+12\,(-i\,Bb^4cd^3+i\,Bab^3d^4)x^3+6\,(i\,Bb^4c^2d^2-8i\,Bab^3cd^3+7i\,Ba^2b^2d^4)x^2+4\,((-12i\,A-i\,B)b^4c^3d+6\,(6i\,A+i\,B)ab^3c^2d^2+18\,(-2i\,A-i\,B)a^2b^2cd^3+(12i\,A+13i\,B)a^3bd^4)x+12\,(-i\,Bb^4d^4x^4-4i\,Bab^3d^4x^3-6i\,Ba^2b^2d^4x^2-3i\,Bb^4c^4+8i\,Bab^3c^3d-6i\,Ba^2b^2c^2d^2+4\,(-i\,Bb^4c^3d+3i\,Bab^3c^2d^2-3i\,Ba^2b^2cd^3)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{144\,((b^9c^3-3\,ab^8c^2d+3\,a^2b^7cd^2-a^3b^6d^3)g^5x^4+4\,(ab^8c^3-3\,a^2b^7c^2d+3\,a^3b^6cd^2-a^4b^5d^3)g^5x^3+6\,(a^2b^7c^3-3\,a^3b^6c^2d+3\,a^4b^5cd^2-a^5b^4d^3)g^5x^2+4\,(a^3b^6c^3-3\,a^4b^5c^2d+3\,a^5b^4cd^2-a^6b^3d^3)g^5x+(a^4b^5c^3-3\,a^5b^4c^2d+3\,a^6b^3cd^2-a^7b^2d^3)g^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 -
3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 -
 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3
- 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3
*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 928 vs. $2(252) = 504$.
time = 8.47, size = 928, normalized size = 3.45

$$-\frac{Bd^4i\log\left(x+\frac{-\frac{Ba^4d^8i}{(ad-bc)^3}+\frac{4Ba^3bcd^7i}{(ad-bc)^3}-\frac{6Ba^2b^2c^2d^6i}{(ad-bc)^3}+\frac{4Bab^3c^3d^5i}{(ad-bc)^3}+Bad^5i-\frac{Bb^4c^4d^4i}{(ad-bc)^3}+Bbcd^4i}{2Bbd^5i}\right)}{12b^2g^5(ad-bc)^3}+\frac{Bd^4i\log\left(x+\frac{\frac{Ba^4d^8i}{(ad-bc)^3}-\frac{4Ba^3bcd^7i}{(ad-bc)^3}+\frac{6Ba^2b^2c^2d^6i}{(ad-bc)^3}-\frac{4Bab^3c^3d^5i}{(ad-bc)^3}+Bad^5i+\frac{Bb^4c^4d^4i}{(ad-bc)^3}+Bbcd^4i}{2Bbd^5i}\right)}{12b^2g^5(ad-bc)^3}+\frac{(-Badi-3Bbci-4Bbdix)\log\left(\frac{e(a+bx)}{c+dx}\right)}{12a^4b^2g^5+48a^3b^3g^5x+72a^2b^4g^5x^2+48ab^5g^5x^3+12b^6g^5x^4}+\frac{-12Aa^3d^3i-12Aa^2bcd^2i+60Aab^2c^2di-36Ab^3c^3i-13Ba^3d^3i-13Ba^2bcd^2i+23Bab^2c^2di-9Bb^3c^3i-12Bb^3d^3ix^3+x^2(-42Bab^2d^3i+6Bb^3cd^2i)+x(-48Aa^2bd^3i+96Aab^2cd^2i-48Ab^3c^2di-52Ba^2bd^3i+20Bab^2cd^2i-4Bb^3c^2di)}{144a^6b^2d^2g^5-288a^5b^3cdg^5+144a^4b^4c^2g^5+x^4\cdot(144a^2b^6d^2g^5-288ab^7cdg^5+144b^8c^2g^5)+x^3\cdot(576a^3b^5d^2g^5-1152a^2b^6cdg^5+576ab^7c^2g^5)+x^2\cdot(864a^4b^4d^2g^5-1728a^3b^5cdg^5+864a^2b^6c^2g^5)+x(576a^5b^3d^2g^5-1152a^4b^4cdg^5+576a^3b^5c^2g^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [**A**]
time = 5.17, size = 382, normalized size = 1.42

$$\frac{\left(-36i\,Bb^2e^5\log\left(\frac{bxe+ae}{dx+c}\right)+\frac{96i\,(bxe+ae)Bbde^4\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{72i\,(bxe+ae)^2Bd^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}-36i\,Ab^2e^5-9i\,Bb^2e^5+\frac{96i\,(bxe+ae)Abde^4}{dx+c}+\frac{32i\,(bxe+ae)Bbde^4}{dx+c}-\frac{72i\,(bxe+ae)^2Ad^2e^3}{(dx+c)^2}-\frac{36i\,(bxe+ae)^2Bd^2e^3}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{144\left(\frac{(bxe+ae)^4b^2c^2g^5}{(dx+c)^4}-\frac{2\,(bxe+ae)^4abcdg^5}{(dx+c)^4}+\frac{(bxe+ae)^4a^2d^2g^5}{(dx+c)^4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/144*(-36*I*B*b^2*e^5*log((b*x*e + a*e)/(d*x + c)) + 96*I*(b*x*e + a*e)*B*
b*d*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 72*I*(b*x*e + a*e)^2*B*d^2
*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 36*I*A*b^2*e^5 - 9*I*B*b^2*
e^5 + 96*I*(b*x*e + a*e)*A*b*d*e^4/(d*x + c) + 32*I*(b*x*e + a*e)*B*b*d*e^4
/(d*x + c) - 72*I*(b*x*e + a*e)^2*A*d^2*e^3/(d*x + c)^2 - 36*I*(b*x*e + a*e
)^2*B*d^2*e^3/(d*x + c)^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e
 - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^4*b^2*c^2*g^5/(d*x + c)^4 - 2*(b*x*e
 + a*e)^4*a*b*c*d*g^5/(d*x + c)^4 + (b*x*e + a*e)^4*a^2*d^2*g^5/(d*x + c)^4
)
```

Mupad [B]
time = 6.46, size = 590, normalized size = 2.19

$$\frac{B\,d^4\,i\,\mathrm{atanh}\left(\frac{12\,a^3\,b^2\,d^3\,g^5-12\,a^2\,b^3\,c\,d^2\,g^5-12\,a\,b^4\,c^2\,d\,g^5+12\,b^5\,c^3\,g^5}{12\,b^2\,g^5\,{\left(a\,d-b\,c\right)}^3}+\frac{2\,b\,d\,x\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}{{\left(a\,d-b\,c\right)}^3}\right)}{6\,b^2\,g^5\,{\left(a\,d-b\,c\right)}^3}-\frac{\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(\frac{B\,c\,i}{4\,b^2\,g^5}+\frac{B\,a\,d\,i}{12\,b^3\,g^5}+\frac{B\,d\,i\,x}{3\,b^2\,g^5}\right)}{4\,a^3\,x+\frac{a^4}{b}+b^3\,x^4+6\,a^2\,b\,x^2+4\,a\,b^2\,x^3}-\frac{\frac{12\,A\,a^3\,d^3\,i+36\,A\,b^3\,c^3\,i+13\,B\,a^3\,d^3\,i+9\,B\,b^3\,c^3\,i-60\,A\,a\,b^2\,c^2\,d\,i+12\,A\,a^2\,b\,c\,d^2\,i-23\,B\,a\,b^2\,c^2\,d\,i+13\,B\,a^2\,b\,c\,d^2\,i}{12\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{x\,\left(12\,A\,a^2\,b\,d^3\,i+13\,B\,a^2\,b\,d^3\,i+12\,A\,b^3\,c^2\,d\,i+B\,b^3\,c^2\,d\,i-24\,A\,a\,b^2\,c\,d^2\,i-5\,B\,a\,b^2\,c\,d^2\,i\right)}{3\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{d\,x^2\,\left(B\,b^3\,c\,d\,i-7\,B\,a\,b^2\,d^2\,i\right)}{2\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{B\,b^3\,d^3\,i\,x^3}{a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2}}{12\,a^4\,b^2\,g^5+48\,a^3\,b^3\,g^5\,x+72\,a^2\,b^4\,g^5\,x^2+48\,a\,b^5\,g^5\,x^3+12\,b^6\,g^5\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*d^4*i*atanh((12*b^5*c^3*g^5 + 12*a^3*b^2*d^3*g^5 - 12*a*b^4*c^2*d*g^5 -
12*a^2*b^3*c*d^2*g^5)/(12*b^2*g^5*(a*d - b*c)^3) + (2*b*d*x*(a^2*d^2 + b^2*
c^2 - 2*a*b*c*d))/(a*d - b*c)^3))/(6*b^2*g^5*(a*d - b*c)^3) - (log((e*(a +
b*x))/(c + d*x))*((B*c*i)/(4*b^2*g^5) + (B*a*d*i)/(12*b^3*g^5) + (B*d*i*x)/
(3*b^2*g^5)))/(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 + 4*a*b^2*x^3) - ((1
2*A*a^3*d^3*i + 36*A*b^3*c^3*i + 13*B*a^3*d^3*i + 9*B*b^3*c^3*i - 60*A*a*b^
2*c^2*d*i + 12*A*a^2*b*c*d^2*i - 23*B*a*b^2*c^2*d*i + 13*B*a^2*b*c*d^2*i)/(
12*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (x*(12*A*a^2*b*d^3*i + 13*B*a^2*b*d^3
*i + 12*A*b^3*c^2*d*i + B*b^3*c^2*d*i - 24*A*a*b^2*c*d^2*i - 5*B*a*b^2*c*d^
2*i))/(3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (d*x^2*(B*b^3*c*d*i - 7*B*a*b^2
*d^2*i))/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (B*b^3*d^3*i*x^3)/(a^2*d^2 +
 b^2*c^2 - 2*a*b*c*d))/(12*a^4*b^2*g^5 + 12*b^6*g^5*x^4 + 48*a^3*b^3*g^5*x
+ 48*a*b^5*g^5*x^3 + 72*a^2*b^4*g^5*x^2)
```

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

Optimal. Leaf size=423

$$\frac{B(bc-ad)^5g^3i^2x}{60b^2d^3}+\frac{B(bc-ad)^4g^3i^2(c+dx)^2}{120bd^4}-\frac{19B(bc-ad)^3g^3i^2(c+dx)^3}{180d^4}+\frac{13bB(bc-ad)^2g^3i^2(c+dx)^4}{120d^4}$$

```
[Out] 1/60*B*(-a*d+b*c)^5*g^3*i^2*x/b^2/d^3+1/120*B*(-a*d+b*c)^4*g^3*i^2*(d*x+c)^
2/b/d^4-19/180*B*(-a*d+b*c)^3*g^3*i^2*(d*x+c)^3/d^4+13/120*b*B*(-a*d+b*c)^2
*g^3*i^2*(d*x+c)^4/d^4-1/30*b^2*B*(-a*d+b*c)*g^3*i^2*(d*x+c)^5/d^4+1/60*B*(
-a*d+b*c)^6*g^3*i^2*ln((b*x+a)/(d*x+c))/b^3/d^4-1/3*(-a*d+b*c)^3*g^3*i^2*(d
*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^4+3/4*b*(-a*d+b*c)^2*g^3*i^2*(d*x+c)^
4*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^4-3/5*b^2*(-a*d+b*c)*g^3*i^2*(d*x+c)^5*(A+B
*ln(e*(b*x+a)/(d*x+c)))/d^4+1/6*b^3*g^3*i^2*(d*x+c)^6*(A+B*ln(e*(b*x+a)/(d*
x+c)))/d^4+1/60*B*(-a*d+b*c)^6*g^3*i^2*ln(d*x+c)/b^3/d^4
```

Rubi [A]
time = 0.30, antiderivative size = 423, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2562, 45, 2382, 12, 1634}

$$\frac{b^3g^3i^2(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6d^4}-\frac{3b^2g^3i^2(c+dx)^5(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^4}-\frac{g^3i^2(c+dx)^3(bc-ad)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d^4}+\frac{3bg^3i^2(c+dx)^4(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^4}+\frac{Bg^3i^2(bc-ad)^6\log\left(\frac{a+bx}{c+dx}\right)}{60b^3d^4}+\frac{Bg^3i^2(bc-ad)^6\log(c+dx)}{60b^3d^4}-\frac{b^2Bg^3i^2(c+dx)^5(bc-ad)}{30d^4}+\frac{Bg^3i^2x(bc-ad)^5}{60b^2d^3}+\frac{Bg^3i^2(c+dx)^2(bc-ad)^4}{120bd^4}-\frac{19Bg^3i^2(c+dx)^3(bc-ad)^3}{180d^4}+\frac{13bBg^3i^2(c+dx)^4(bc-ad)^2}{120d^4}$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 45

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

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

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

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

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

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

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

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

Mathematica [A]
time = 0.24, size = 429, normalized size = 1.01

$$\frac{g^3i^2\left(90d^4(bc-ad)^2(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+144d^5(bc-ad)(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+60d^6(a+bx)^6\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-15B(bc-ad)^3\left(6bd(bc-ad)^2x+3d^2(-bc+ad)(a+bx)^2+2d^3(a+bx)^3-6(bc-ad)^3\log(c+dx)\right)+12B(bc-ad)^2\left(12bd(bc-ad)^3x-6d^2(bc-ad)^2(a+bx)^2+4d^3(bc-ad)(a+bx)^3-3d^4(a+bx)^4-12(bc-ad)^4\log(c+dx)\right)-B(bc-ad)\left(60bd(bc-ad)^4x+30d^2(-bc+ad)^3(a+bx)^2+20d^3(bc-ad)^2(a+bx)^3+15d^4(-bc+ad)(a+bx)^4+12d^5(a+bx)^5-60(bc-ad)^5\log(c+dx)\right)\right)}{360b^3d^4}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 14442 vs. $2(401) = 802$.
time = 0.76, size = 14443, normalized size = 34.14

method	result
risch	$\frac{17i^2g^3dB\,a^3c\,x^2}{60}-\frac{i^2g^3bB\,a^2c^2x^2}{4}-\frac{i^2g^3b^2Ba\,c^3x^2}{20d}+i^2g^3A\,a^3c^2x-\frac{i^2g^3bB\,a^2c^3x}{4d}+\frac{3i^2g^3b^2dAac\,x^4}{2}-$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1747 vs. $2(372) = 744$.
time = 0.33, size = 1747, normalized size = 4.13

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*A*b^3*d^2*g^3*x^6 - 2/5*A*b^3*c*d*g^3*x^5 - 3/5*A*a*b^2*d^2*g^3*x^5 -
1/4*A*b^3*c^2*g^3*x^4 - 3/2*A*a*b^2*c*d*g^3*x^4 - 3/4*A*a^2*b*d^2*g^3*x^4 -
 A*a*b^2*c^2*g^3*x^3 - 2*A*a^2*b*c*d*g^3*x^3 - 1/3*A*a^3*d^2*g^3*x^3 - 3/2*
A*a^2*b*c^2*g^3*x^2 - A*a^3*c*d*g^3*x^2 - (x*log(b*x*e/(d*x + c) + a*e/(d*x
 + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a^3*c^2*g^3 - 3/2*(x^2*log(
b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/
d^2 - (b*c - a*d)*x/(b*d))*B*a^2*b*c^2*g^3 - 1/2*(2*x^3*log(b*x*e/(d*x + c)
 + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2
*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2*c^2*g^3 -
 1/24*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4
+ 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d -
a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*c^2*g^3 - (x^2*l
og(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x +
c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^3*c*d*g^3 - (2*x^3*log(b*x*e/(d*x + c) +
a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*
d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^2*b*c*d*g^3 - 1/
4*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*
c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*
b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a*b^2*c*d*g^3 - 1/30*(12
*x^5*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^
5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*
b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b
```

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

Fricas [A]
time = 0.49, size = 689, normalized size = 1.63

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 1727 vs. 2(398) = 796.
time = 8.94, size = 1727, normalized size = 4.08

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*b**3*d**2*g**3*i**2*x**6/6 + B*a**4*g**3*i**2*(a**2*d**2 - 6*a*b*c*d + 15
*b**2*c**2)*log(x + (B*a**6*c*d**5*g**3*i**2 - 6*B*a**5*b*c**2*d**4*g**3*i*
*2 + B*a**5*d**4*g**3*i**2*(a**2*d**2 - 6*a*b*c*d + 15*b**2*c**2)/b + 35*B*
a**4*b**2*c**3*d**3*g**3*i**2 - B*a**4*c*d**3*g**3*i**2*(a**2*d**2 - 6*a*b*
c*d + 15*b**2*c**2) - 15*B*a**3*b**3*c**4*d**2*g**3*i**2 + 6*B*a**2*b**4*c*
*5*d*g**3*i**2 - B*a*b**5*c**6*g**3*i**2)/(B*a**6*d**6*g**3*i**2 - 6*B*a**5
*b*c*d**5*g**3*i**2 + 15*B*a**4*b**2*c**2*d**4*g**3*i**2 + 20*B*a**3*b**3*c
**3*d**3*g**3*i**2 - 15*B*a**2*b**4*c**4*d**2*g**3*i**2 + 6*B*a*b**5*c**5*d
*g**3*i**2 - B*b**6*c**6*g**3*i**2))/(60*b**3) - B*c**3*g**3*i**2*(20*a**3*
d**3 - 15*a**2*b*c*d**2 + 6*a*b**2*c**2*d - b**3*c**3)*log(x + (B*a**6*c*d*
*5*g**3*i**2 - 6*B*a**5*b*c**2*d**4*g**3*i**2 + 35*B*a**4*b**2*c**3*d**3*g*
*3*i**2 - 15*B*a**3*b**3*c**4*d**2*g**3*i**2 + 6*B*a**2*b**4*c**5*d*g**3*i*
*2 - B*a*b**5*c**6*g**3*i**2 - B*a*b**2*c**3*g**3*i**2*(20*a**3*d**3 - 15*a
**2*b*c*d**2 + 6*a*b**2*c**2*d - b**3*c**3) + B*b**3*c**4*g**3*i**2*(20*a**
3*d**3 - 15*a**2*b*c*d**2 + 6*a*b**2*c**2*d - b**3*c**3)/d)/(B*a**6*d**6*g*
*3*i**2 - 6*B*a**5*b*c*d**5*g**3*i**2 + 15*B*a**4*b**2*c**2*d**4*g**3*i**2
+ 20*B*a**3*b**3*c**3*d**3*g**3*i**2 - 15*B*a**2*b**4*c**4*d**2*g**3*i**2 +
 6*B*a*b**5*c**5*d*g**3*i**2 - B*b**6*c**6*g**3*i**2))/(60*d**4) + x**5*(3*
A*a*b**2*d**2*g**3*i**2/5 + 2*A*b**3*c*d*g**3*i**2/5 + B*a*b**2*d**2*g**3*i
**2/30 - B*b**3*c*d*g**3*i**2/30) + x**4*(3*A*a**2*b*d**2*g**3*i**2/4 + 3*A
*a*b**2*c*d*g**3*i**2/2 + A*b**3*c**2*g**3*i**2/4 + 13*B*a**2*b*d**2*g**3*i
**2/120 - B*a*b**2*c*d*g**3*i**2/20 - 7*B*b**3*c**2*g**3*i**2/120) + x**3*(
A*a**3*d**2*g**3*i**2/3 + 2*A*a**2*b*c*d*g**3*i**2 + A*a*b**2*c**2*g**3*i**
2 + 19*B*a**3*d**2*g**3*i**2/180 + 7*B*a**2*b*c*d*g**3*i**2/60 - 13*B*a*b**
2*c**2*g**3*i**2/60 - B*b**3*c**3*g**3*i**2/(180*d)) + x**2*(A*a**3*c*d*g**
3*i**2 + 3*A*a**2*b*c**2*g**3*i**2/2 + B*a**4*d**2*g**3*i**2/(120*b) + 17*B
*a**3*c*d*g**3*i**2/60 - B*a**2*b*c**2*g**3*i**2/4 - B*a*b**2*c**3*g**3*i**
2/(20*d) + B*b**3*c**4*g**3*i**2/(120*d**2)) + x*(A*a**3*c**2*g**3*i**2 - B
*a**5*d**2*g**3*i**2/(60*b**2) + B*a**4*c*d*g**3*i**2/(10*b) + B*a**3*c**2*
g**3*i**2/12 - B*a**2*b*c**3*g**3*i**2/(4*d) + B*a*b**2*c**4*g**3*i**2/(10*
d**2) - B*b**3*c**5*g**3*i**2/(60*d**3)) + (B*a**3*c**2*g**3*i**2*x + B*a**
3*c*d*g**3*i**2*x**2 + B*a**3*d**2*g**3*i**2*x**3/3 + 3*B*a**2*b*c**2*g**3*
i**2*x**2/2 + 2*B*a**2*b*c*d*g**3*i**2*x**3 + 3*B*a**2*b*d**2*g**3*i**2*x**
4/4 + B*a*b**2*c**2*g**3*i**2*x**3 + 3*B*a*b**2*c*d*g**3*i**2*x**4/2 + 3*B*
a*b**2*d**2*g**3*i**2*x**5/5 + B*b**3*c**2*g**3*i**2*x**4/4 + 2*B*b**3*c*d*
g**3*i**2*x**5/5 + B*b**3*d**2*g**3*i**2*x**6/6)*log(e*(a + b*x)/(c + d*x))
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 7651 vs. $2(372) = 744$.

time = 4.06, size = 7651, normalized size = 18.09

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/360*(6*B*b^13*c^7*g^3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 42*B*a*
b^12*c^6*d*g^3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 126*B*a^2*b^11*c
^5*d^2*g^3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 210*B*a^3*b^10*c^4*d
^3*g^3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 210*B*a^4*b^9*c^3*d^4*g^
3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 126*B*a^5*b^8*c^2*d^5*g^3*e^7
*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 42*B*a^6*b^7*c*d^6*g^3*e^7*log(-b*
e + (b*x*e + a*e)*d/(d*x + c)) - 6*B*a^7*b^6*d^7*g^3*e^7*log(-b*e + (b*x*e
+ a*e)*d/(d*x + c)) - 36*(b*x*e + a*e)*B*b^12*c^7*d*g^3*e^6*log(-b*e + (b*x
*e + a*e)*d/(d*x + c))/(d*x + c) + 252*(b*x*e + a*e)*B*a*b^11*c^6*d^2*g^3*e
^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 756*(b*x*e + a*e)*B*a^
2*b^10*c^5*d^3*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 12
60*(b*x*e + a*e)*B*a^3*b^9*c^4*d^4*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c) - 1260*(b*x*e + a*e)*B*a^4*b^8*c^3*d^5*g^3*e^6*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 756*(b*x*e + a*e)*B*a^5*b^7*c^2*d^6*g
^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 252*(b*x*e + a*e)*
B*a^6*b^6*c*d^7*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 3
6*(b*x*e + a*e)*B*a^7*b^5*d^8*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))
/(d*x + c) + 90*(b*x*e + a*e)^2*B*b^11*c^7*d^2*g^3*e^5*log(-b*e + (b*x*e +
a*e)*d/(d*x + c))/(d*x + c)^2 - 630*(b*x*e + a*e)^2*B*a*b^10*c^6*d^3*g^3*e^
5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 1890*(b*x*e + a*e)^2*
B*a^2*b^9*c^5*d^4*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2
 - 3150*(b*x*e + a*e)^2*B*a^3*b^8*c^4*d^5*g^3*e^5*log(-b*e + (b*x*e + a*e)*
d/(d*x + c))/(d*x + c)^2 + 3150*(b*x*e + a*e)^2*B*a^4*b^7*c^3*d^6*g^3*e^5*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 1890*(b*x*e + a*e)^2*B*a
^5*b^6*c^2*d^7*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 +
630*(b*x*e + a*e)^2*B*a^6*b^5*c*d^8*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x
 + c))/(d*x + c)^2 - 90*(b*x*e + a*e)^2*B*a^7*b^4*d^9*g^3*e^5*log(-b*e + (b
*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 120*(b*x*e + a*e)^3*B*b^10*c^7*d^3*g
^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 840*(b*x*e + a*e
)^3*B*a*b^9*c^6*d^4*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
^3 - 2520*(b*x*e + a*e)^3*B*a^2*b^8*c^5*d^5*g^3*e^4*log(-b*e + (b*x*e + a*e
)*d/(d*x + c))/(d*x + c)^3 + 4200*(b*x*e + a*e)^3*B*a^3*b^7*c^4*d^6*g^3*e^4
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 4200*(b*x*e + a*e)^3*B
*a^4*b^6*c^3*d^7*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3
+ 2520*(b*x*e + a*e)^3*B*a^5*b^5*c^2*d^8*g^3*e^4*log(-b*e + (b*x*e + a*e)*d
/(d*x + c))/(d*x + c)^3 - 840*(b*x*e + a*e)^3*B*a^6*b^4*c*d^9*g^3*e^4*log(-
b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 120*(b*x*e + a*e)^3*B*a^7*b^
3*d^10*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 90*(b*x*
e + a*e)^4*B*b^9*c^7*d^4*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
 + c)^4 - 630*(b*x*e + a*e)^4*B*a*b^8*c^6*d^5*g^3*e^3*log(-b*e + (b*x*e + a
*e)*d/(d*x + c))/(d*x + c)^4 + 1890*(b*x*e + a*e)^4*B*a^2*b^7*c^5*d^6*g^3*e
^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 3150*(b*x*e + a*e)^4
```

```
*B*a^3*b^6*c^4*d^7*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^
4 + 3150*(b*x*e + a*e)^4*B*a^4*b^5*c^3*d^8*g^3*e^3*log(-b*e + (b*x*e + a*e)
*d/(d*x + c))/(d*x + c)^4 - 1890*(b*x*e + a*e)^4*B*a^5*b^4*c^2*d^9*g^3*e^3*
log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 630*(b*x*e + a*e)^4*B*a
^6*b^3*c*d^10*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 9
0*(b*x*e + a*e)^4*B*a^7*b^2*d^11*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x +
c))/(d*x + c)^4 - 36*(b*x*e + a*e)^5*B*b^8*c^7*d^5*g^3*e^2*log(-b*e + (b*x*
e + a*e)*d/(d*x + c))/(d*x + c)^5 + 252*(b*x*e + a*e)^5*B*a*b^7*c^6*d^6*g^3
*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 756*(b*x*e + a*e)^
5*B*a^2*b^6*c^5*d^7*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
^5 + 1260*(b*x*e + a*e)^5*B*a^3*b^5*c^4*d^8*g^3*e^2*log(-b*e + (b*x*e + a*e
)*d/(d*x + c))/(d*x + c)^5 - 1260*(b*x*e + a*e)^5*B*a^4*b^4*c^3*d^9*g^3*e^2
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 756*(b*x*e + a*e)^5*B*
a^5*b^3*c^2*d^10*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5
- 252*(b*x*e + a*e)^5*B*a^6*b^2*c*d^11*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(
d*x + c))/(d*x + c)^5 + 36*(b*x*e + a*e)^5*B*a^7*b*d^12*g^3*e^2*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 6*(b*x*e + a*e)^6*B*b^7*c^7*d^6*g^
3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^6 - 42*(b*x*e + a*e)^6*
B*a*b^6*c^6*d^7*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^6 + 1
26*(b*x*e + a*e)^6*B*a^2*b^5*c^5*d^8*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^6 - 210*(b*x*e + a*e)^6*B*a^3*b^4*c^4*d^9*g^3*e*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^6 + 210*(b*x*e + a*e)^6*B*a^4*b^3*c^3*
d^10*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^6 - 126*(b*x*e +
 a*e)^6*B*a^5*b^2*c^2*d^11*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
 + c)^6 + 42*(b*x*e + a*e)^6*B*a^6*b*c*d^12*g^3...
```

Mupad [B]
time = 5.89, size = 2473, normalized size = 5.85

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^3*((g^3*i^2*(16*A*a^3*d^3 + 4*A*b^3*c^3 + 3*B*a^3*d^3 - B*b^3*c^3 + 48*A*
a*b^2*c^2*d + 72*A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2))/(12*d)
 + ((60*a*d + 60*b*c)*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d - B*b*
c))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d)
 - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2 - 2*B*b^2*c^2 + 60
*A*a*b*c*d - B*a*b*c*d))/5 + A*a*b^2*c*d*g^3*i^2))/(180*b*d) - (a*c*((b^2*d
*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d - B*b*c))/6 - (A*b^2*d*g^3*i^2*(60*a*
d + 60*b*c))/60))/(3*b*d)) - x^4*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B
*a*d - B*b*c))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c
))/(240*b*d) - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2 - 2*B*
b^2*c^2 + 60*A*a*b*c*d - B*a*b*c*d))/20 + (A*a*b^2*c*d*g^3*i^2)/4) + x^2*((
```

```
a*c*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d - B*b*c))/6 - (A*b^2*d*g
^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (b*g^3*i^2*(30*
A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2 - 2*B*b^2*c^2 + 60*A*a*b*c*d - B*a*b
*c*d))/5 + A*a*b^2*c*d*g^3*i^2))/(2*b*d) - ((60*a*d + 60*b*c)*((g^3*i^2*(16
*A*a^3*d^3 + 4*A*b^3*c^3 + 3*B*a^3*d^3 - B*b^3*c^3 + 48*A*a*b^2*c^2*d + 72*
A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2))/(4*d) + ((60*a*d + 60*b
*c)*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d - B*b*c))/6 - (A*b^2*d*g
^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (b*g^3*i^2*(30*
A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2 - 2*B*b^2*c^2 + 60*A*a*b*c*d - B*a*b
*c*d))/5 + A*a*b^2*c*d*g^3*i^2))/(60*b*d) - (a*c*((b^2*d*g^3*i^2*(24*A*a*d
 + 18*A*b*c + B*a*d - B*b*c))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60))/(
b*d)))/(120*b*d) + (a*g^3*i^2*(3*A*a^3*d^3 + 12*A*b^3*c^3 + B*a^3*d^3 - 3*B
*b^3*c^3 + 54*A*a*b^2*c^2*d + 36*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d + 5*B*a^2*
b*c*d^2))/(6*b*d)) + log((e*(a + b*x))/(c + d*x))*(B*a^3*c^2*g^3*i^2*x + (B
*a*g^3*i^2*x^3*(a^2*d^2 + 3*b^2*c^2 + 6*a*b*c*d))/3 + (B*b*g^3*i^2*x^4*(3*a
^2*d^2 + b^2*c^2 + 6*a*b*c*d))/4 + (B*b^3*d^2*g^3*i^2*x^6)/6 + (B*a^2*c*g^3
*i^2*x^2*(2*a*d + 3*b*c))/2 + (B*b^2*d*g^3*i^2*x^5*(3*a*d + 2*b*c))/5) + x^
5*((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d - B*b*c))/30 - (A*b^2*d*g^3*
i^2*(60*a*d + 60*b*c))/300) - x*(((60*a*d + 60*b*c)*((a*c*((((b^2*d*g^3*i^2
*(24*A*a*d + 18*A*b*c + B*a*d - B*b*c))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b
*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*
c^2 + 3*B*a^2*d^2 - 2*B*b^2*c^2 + 60*A*a*b*c*d - B*a*b*c*d))/5 + A*a*b^2*c*
d*g^3*i^2))/(b*d) - ((60*a*d + 60*b*c)*((g^3*i^2*(16*A*a^3*d^3 + 4*A*b^3*c^
3 + 3*B*a^3*d^3 - B*b^3*c^3 + 48*A*a*b^2*c^2*d + 72*A*a^2*b*c*d^2 - 5*B*a*b
^2*c^2*d + 3*B*a^2*b*c*d^2))/(4*d) + ((60*a*d + 60*b*c)*((((b^2*d*g^3*i^2*(
24*A*a*d + 18*A*b*c + B*a*d - B*b*c))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c
))/60)*(60*a*d + 60*b*c))/(60*b*d) - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^
2 + 3*B*a^2*d^2 - 2*B*b^2*c^2 + 60*A*a*b*c*d - B*a*b*c*d))/5 + A*a*b^2*c*d*
g^3*i^2))/(60*b*d) - (a*c*((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d - B*
b*c))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60))/(b*d)))/(60*b*d) + (a*g^
3*i^2*(3*A*a^3*d^3 + 12*A*b^3*c^3 + B*a^3*d^3 - 3*B*b^3*c^3 + 54*A*a*b^2*c^
2*d + 36*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d + 5*B*a^2*b*c*d^2))/(3*b*d)))/(60*
b*d) + (a*c*((g^3*i^2*(16*A*a^3*d^3 + 4*A*b^3*c^3 + 3*B*a^3*d^3 - B*b^3*c^3
 + 48*A*a*b^2*c^2*d + 72*A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)
)/(4*d) + ((60*a*d + 60*b*c)*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d
 - B*b*c))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(
60*b*d) - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2 - 2*B*b^2*c
^2 + 60*A*a*b*c*d - B*a*b*c*d))/5 + A*a*b^2*c*d*g^3*i^2))/(60*b*d) - (a*c*(
(b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d - B*b*c))/6 - (A*b^2*d*g^3*i^2*
(60*a*d + 60*b*c))/60))/(b*d)))/(b*d) - (a^2*c*g^3*i^2*(6*A*a^2*d^2 + 12*A*
b^2*c^2 + 2*B*a^2*d^2 - 3*B*b^2*c^2 + 24*A*a*b*c*d + B*a*b*c*d))/(2*b*d)) +
 (log(a + b*x)*(B*a^6*d^2*g^3*i^2 + 15*B*a^4*b^2*c^2*g^3*i^2 - 6*B*a^5*b*c*
d*g^3*i^2))/(60*b^3) + (log(c + d*x)*(B*b^3*c^6*g^3*i^2 - 20*B*a^3*c^3*d^3*
g^3*i^2 - 6*B*a*b^2*c^5*d*g^3*i^2 + 15*B*a^2*b*c^4*d^2*g^3*i^2))/(60*d^4) +
 (A*b^3*d^2*g^3*i^2*x^6)/6
```

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

Optimal. Leaf size=337

$$-\frac{B(bc-ad)^4g^2i^2x}{30b^2d^2}-\frac{B(bc-ad)^3g^2i^2(c+dx)^2}{60bd^3}+\frac{B(bc-ad)^2g^2i^2(c+dx)^3}{10d^3}-\frac{bB(bc-ad)g^2i^2(c+dx)^4}{20d^3}-\frac{B(b$$

```
[Out] -1/30*B*(-a*d+b*c)^4*g^2*i^2*x/b^2/d^2-1/60*B*(-a*d+b*c)^3*g^2*i^2*(d*x+c)^
2/b/d^3+1/10*B*(-a*d+b*c)^2*g^2*i^2*(d*x+c)^3/d^3-1/20*b*B*(-a*d+b*c)*g^2*i
^2*(d*x+c)^4/d^3-1/30*B*(-a*d+b*c)^5*g^2*i^2*ln((b*x+a)/(d*x+c))/b^3/d^3+1/
3*(-a*d+b*c)^2*g^2*i^2*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3-1/2*b*(-a*
d+b*c)*g^2*i^2*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3+1/5*b^2*g^2*i^2*(d
*x+c)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3-1/30*B*(-a*d+b*c)^5*g^2*i^2*ln(d*x+
c)/b^3/d^3
```

Rubi [A]
time = 0.23, antiderivative size = 337, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2562, 45, 2382, 12, 907}

$$\frac{b^2g^2i^2(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^3}+\frac{g^2i^2(c+dx)^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d^3}-\frac{bg^2i^2(c+dx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d^3}-\frac{Bg^2i^2(bc-ad)^5\log\left(\frac{a+bx}{c+dx}\right)}{30b^3d^3}-\frac{Bg^2i^2(bc-ad)^5\log(c+dx)}{30b^3d^3}-\frac{Bg^2i^2x(bc-ad)^4}{30b^2d^2}-\frac{Bg^2i^2(c+dx)^2(bc-ad)^3}{60bd^3}+\frac{Bg^2i^2(c+dx)^3(bc-ad)^2}{10d^3}-\frac{bBg^2i^2(c+dx)^4(bc-ad)}{20d^3}$$

Antiderivative was successfully verified.

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

```
[Out] -1/30*(B*(b*c - a*d)^4*g^2*i^2*x)/(b^2*d^2) - (B*(b*c - a*d)^3*g^2*i^2*(c +
 d*x)^2)/(60*b*d^3) + (B*(b*c - a*d)^2*g^2*i^2*(c + d*x)^3)/(10*d^3) - (b*B
*(b*c - a*d)*g^2*i^2*(c + d*x)^4)/(20*d^3) - (B*(b*c - a*d)^5*g^2*i^2*Log[(
a + b*x)/(c + d*x)])/(30*b^3*d^3) + ((b*c - a*d)^2*g^2*i^2*(c + d*x)^3*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(3*d^3) - (b*(b*c - a*d)*g^2*i^2*(c + d*x
)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^3) + (b^2*g^2*i^2*(c + d*x)^
5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*d^3) - (B*(b*c - a*d)^5*g^2*i^2*
Log[c + d*x])/(30*b^3*d^3)
```

Rule 12

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

Rule 45

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

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

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

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

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

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

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

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

Mathematica [A]
time = 0.17, size = 362, normalized size = 1.07

$$\frac{g^2i^2\left(20d^3(bc-ad)^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+30d^4(bc-ad)(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+12d^5(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+10B(bc-ad)^3\left(2bd(bc-ad)x-d^2(a+bx)^2-2(bc-ad)^2\log(c+dx)\right)-5B(bc-ad)^2\left(6bd(bc-ad)^2x+3d^2(-bc+ad)(a+bx)^2+2d^3(a+bx)^3-6(bc-ad)^3\log(c+dx)\right)+B(bc-ad)\left(12bd(bc-ad)^3x-6d^2(bc-ad)^2(a+bx)^2+4d^3(bc-ad)(a+bx)^3-3d^4(a+bx)^4-12(bc-ad)^4\log(c+dx)\right)\right)}{60b^3d^3}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 8296 vs. $2(319) = 638$.
time = 0.63, size = 8297, normalized size = 24.62

method	result
risch	$\frac{i^2g^2bB\ln(dx+c)a\,c^4}{6d^2}-\frac{i^2g^2dB\ln(-bx-a)a^4c}{6b^2}+\frac{i^2g^2dB\,a^3cx}{6b}-\frac{i^2g^2bBa\,c^3x}{6d}-\frac{i^2g^2bBa\,c^2x^2}{4}+i^2g^2A\,a^2c^2x$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1170 vs. $2(295) = 590$.
time = 0.31, size = 1170, normalized size = 3.47

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A]
time = 0.46, size = 505, normalized size = 1.50

$$-\frac{12\,Ab^5d^5g^2x^5+3\,\left((10\,A-B)b^5cd^4+(10\,A+B)ab^4d^5\right)g^2x^4+2\,\left((10\,A-3\,B)b^5c^2d^3+40\,Aab^4cd^4+(10\,A+3\,B)a^2b^3d^5\right)g^2x^3-\left(Bb^5c^3d^2-15\,(4\,A-B)ab^4c^2d^3-15\,(4\,A+B)a^2b^3cd^4-Ba^3b^2d^5\right)g^2x^2+2\,\left(Bb^5c^4d-5\,Bab^4c^3d^2+30\,Aa^2b^3c^2d^3+5\,Ba^3b^2cd^4-Ba^4bd^5\right)g^2x+2\,\left(10\,Ba^3b^2c^2d^3-5\,Ba^4bcd^4+Ba^5d^5\right)g^2\log\left(\frac{bx+a}{b}\right)-2\,\left(Bb^5c^5-5\,Bab^4c^4d+10\,Ba^2b^3c^3d^2\right)g^2\log\left(\frac{dx+c}{d}\right)+2\,\left(6\,Bb^5d^5g^2x^5+30\,Ba^2b^3c^2d^3g^2x+15\,\left(Bb^5cd^4+Bab^4d^5\right)g^2x^4+10\,\left(Bb^5c^2d^3+4\,Bab^4cd^4+Ba^2b^3d^5\right)g^2x^3+30\,\left(Bab^4c^2d^3+Ba^2b^3cd^4\right)g^2x^2\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{60\,b^3d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/60*(12*A*b^5*d^5*g^2*x^5 + 3*((10*A - B)*b^5*c*d^4 + (10*A + B)*a*b^4*d^
5)*g^2*x^4 + 2*((10*A - 3*B)*b^5*c^2*d^3 + 40*A*a*b^4*c*d^4 + (10*A + 3*B)*
a^2*b^3*d^5)*g^2*x^3 - (B*b^5*c^3*d^2 - 15*(4*A - B)*a*b^4*c^2*d^3 - 15*(4*
A + B)*a^2*b^3*c*d^4 - B*a^3*b^2*d^5)*g^2*x^2 + 2*(B*b^5*c^4*d - 5*B*a*b^4*
c^3*d^2 + 30*A*a^2*b^3*c^2*d^3 + 5*B*a^3*b^2*c*d^4 - B*a^4*b*d^5)*g^2*x + 2
*(10*B*a^3*b^2*c^2*d^3 - 5*B*a^4*b*c*d^4 + B*a^5*d^5)*g^2*log((b*x + a)/b)
- 2*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2)*g^2*log((d*x + c)/
d) + 2*(6*B*b^5*d^5*g^2*x^5 + 30*B*a^2*b^3*c^2*d^3*g^2*x + 15*(B*b^5*c*d^4
+ B*a*b^4*d^5)*g^2*x^4 + 10*(B*b^5*c^2*d^3 + 4*B*a*b^4*c*d^4 + B*a^2*b^3*d^
5)*g^2*x^3 + 30*(B*a*b^4*c^2*d^3 + B*a^2*b^3*c*d^4)*g^2*x^2)*log((b*x + a)*
e/(d*x + c)))/(b^3*d^3)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 1266 vs. $2(311) = 622$.
time = 4.45, size = 1266, normalized size = 3.76

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 5571 vs. $2(295) = 590$.
time = 4.10, size = 5571, normalized size = 16.53

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/60*(2*B*b^11*c^6*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 12*B*a*b^10*c^5*d*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 30*B*a^2*b^9*c^4*d^2*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 40*B*a^3*b^8*c^3*d^3*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 30*B*a^4*b^7*c^2*d^4*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 12*B*a^5*b^6*c*d^5*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 2*B*a^6*b^5*d^6*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 10*(b*x*e + a*e)*B*b^10*c^6*d*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 60*(b*x*e + a*e)*B*a*b^9*c^5*d^2*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 150*(b*x*e + a*e)*B*a^2*b^8*c^4*d^3*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 200*(b*x*e + a*e)*B*a^3*b^7*c^3*d^4*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 150*(b*x*e + a*e)*B*a^4*b^6*c^2*d^5*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 60*(b*x*e + a*e)*B*a^5*b^5*c*d^6*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 10*(b*x*e + a*e)*B*a^6*b^4*d^7*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 20*(b*x*e + a*e)^2*B*b^9*c^6*d^2*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 120*(b*x*e + a*e)^2*B*a*b^8*c^5*d^3*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 300*(b*x*e + a*e)^2*B*a^2*b^7*c^4*d^4*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 400*(b*x*e + a*e)^2*B*a^3*b^6*c^3*d^5*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 300*(b*x*e + a*e)^2*B*a^4*b^5*c^2*d^6*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 120*(b*x*e + a*e)^2*B*a^5*b^4*c*d^7*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 20*(b*x*e + a*e)^2*B*a^6*b^3*d^8*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 20*(b*x*e + a*e)^3*B*b^8*c^6*d^3*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 120*(b*x*e + a*e)^3*B*a*b^7*c^5*d^4*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 300*(b*x*e + a*e)^3*B*a^2*b^6*c^4*d^5*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 400*(b*x*e + a*e)^3*B*a^3*b^5*c^3*d^6*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 300*(b*x*e + a*e)^3*B*a^4*b^4*c^2*d^7*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 120*(b*x*e + a*e)^3*B*a^5*b^3*c*d^8*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 20*(b*x*e + a*e)^3*B*a^6*b^2*d^9*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 10*(b*x*e + a*e)^4*B*b^7*c^6*d^4*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 60*(b*x*e + a*e)^4*B*a*b^6*c^5*d^5*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 150*(b*x*e + a*e)^4*B*a^2*b^5*c^4*d^6*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 200*(b*x*e + a*e)^4*B*a^3*b^4*c^3*d^7*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 150*(b*x*e + a*e)^4*B*a^4*b^3*c^2*d^8*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 60*(b*x*e + a*e)^4*B*a^5*b^2*c*d^9*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 10*(b*x*e + a*e)^4*B*a^6*b*d^10*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 2*(b*x*e + a*e)^5*B*b^6*c^6*d^5*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 12*(b*x*e + a*e)^5*B*a*b^5*c^5*d^6*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 30*(b*x*e + a*e)^5*B*a^2*b^4*c^4*d^7*g^2*e*log(-b*e + (b*x*e + a*e

```
)*d/(d*x + c))/(d*x + c)^5 + 40*(b*x*e + a*e)^5*B*a^3*b^3*c^3*d^8*g^2*e*log
(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 30*(b*x*e + a*e)^5*B*a^4*b
^2*c^2*d^9*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 12*(b*
x*e + a*e)^5*B*a^5*b*c*d^10*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*
x + c)^5 - 2*(b*x*e + a*e)^5*B*a^6*d^11*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d
*x + c))/(d*x + c)^5 + 20*(b*x*e + a*e)^3*B*b^8*c^6*d^3*g^2*e^3*log((b*x*e
+ a*e)/(d*x + c))/(d*x + c)^3 - 120*(b*x*e + a*e)^3*B*a*b^7*c^5*d^4*g^2*e^3
*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 300*(b*x*e + a*e)^3*B*a^2*b^6*c
^4*d^5*g^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 400*(b*x*e + a*e)
^3*B*a^3*b^5*c^3*d^6*g^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 300
*(b*x*e + a*e)^3*B*a^4*b^4*c^2*d^7*g^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*
x + c)^3 - 120*(b*x*e + a*e)^3*B*a^5*b^3*c*d^8*g^2*e^3*log((b*x*e + a*e)/(d
*x + c))/(d*x + c)^3 + 20*(b*x*e + a*e)^3*B*a^6*b^2*d^9*g^2*e^3*log((b*x*e
+ a*e)/(d*x + c))/(d*x + c)^3 - 10*(b*x*e + a*e)^4*B*b^7*c^6*d^4*g^2*e^2*lo
g((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 60*(b*x*e + a*e)^4*B*a*b^6*c^5*d^5
*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 150*(b*x*e + a*e)^4*B*a
^2*b^5*c^4*d^6*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 200*(b*x*
e + a*e)^4*B*a^3*b^4*c^3*d^7*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)
^4 - 150*(b*x*e + a*e)^4*B*a^4*b^3*c^2*d^8*g^2*e^2*log((b*x*e + a*e)/(d*x +
 c))/(d*x + c)^4 + 60*(b*x*e + a*e)^4*B*a^5*b^2*c*d^9*g^2*e^2*log((b*x*e +
a*e)/(d*x + c))/(d*x + c)^4 - 10*(b*x*e + a*e)^4*B*a^6*b*d^10*g^2*e^2*log((
b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 2*(b*x*e ...
```

Mupad [B]
time = 5.34, size = 1287, normalized size = 3.82

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log((e*(a + b*x))/(c + d*x))*((B*g^2*i^2*x^3*(a^2*d^2 + b^2*c^2 + 4*a*b*c*d
))/3 + B*a^2*c^2*g^2*i^2*x + (B*b^2*d^2*g^2*i^2*x^5)/5 + B*a*c*g^2*i^2*x^2*
(a*d + b*c) + (B*b*d*g^2*i^2*x^4*(a*d + b*c))/2) - x^3*(((30*a*d + 30*b*c)*
((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d - B*b*c))/5 - (A*b*d*g^2*i^2*(30
*a*d + 30*b*c))/30))/(90*b*d) - (g^2*i^2*(6*A*a^2*d^2 + 6*A*b^2*c^2 + B*a^2
*d^2 - B*b^2*c^2 + 18*A*a*b*c*d))/6 + (A*a*b*c*d*g^2*i^2)/3) + x*((a*c*(((3
0*a*d + 30*b*c)*((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d - B*b*c))/5 - (A
*b*d*g^2*i^2*(30*a*d + 30*b*c))/30))/(30*b*d) - (g^2*i^2*(6*A*a^2*d^2 + 6*A
*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 18*A*a*b*c*d))/2 + A*a*b*c*d*g^2*i^2))/(
b*d) - ((30*a*d + 30*b*c)*(((30*a*d + 30*b*c)*(((30*a*d + 30*b*c)*((b*d*g^2
*i^2*(15*A*a*d + 15*A*b*c + B*a*d - B*b*c))/5 - (A*b*d*g^2*i^2*(30*a*d + 30
*b*c))/30))/(30*b*d) - (g^2*i^2*(6*A*a^2*d^2 + 6*A*b^2*c^2 + B*a^2*d^2 - B*
b^2*c^2 + 18*A*a*b*c*d))/2 + A*a*b*c*d*g^2*i^2))/(30*b*d) + (g^2*i^2*(3*A*a
^3*d^3 + 3*A*b^3*c^3 + B*a^3*d^3 - B*b^3*c^3 + 27*A*a*b^2*c^2*d + 27*A*a^2*
```

```
b*c*d^2 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2))/(3*b*d) - (a*c*((b*d*g^2*i^2*
(15*A*a*d + 15*A*b*c + B*a*d - B*b*c))/5 - (A*b*d*g^2*i^2*(30*a*d + 30*b*c)
)/30))/(b*d)))/(30*b*d) + (a*c*g^2*i^2*(3*A*a^2*d^2 + 3*A*b^2*c^2 + B*a^2*d
^2 - B*b^2*c^2 + 9*A*a*b*c*d))/(b*d)) + x^2*(((30*a*d + 30*b*c)*(((30*a*d +
 30*b*c)*((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d - B*b*c))/5 - (A*b*d*g^
2*i^2*(30*a*d + 30*b*c))/30))/(30*b*d) - (g^2*i^2*(6*A*a^2*d^2 + 6*A*b^2*c^
2 + B*a^2*d^2 - B*b^2*c^2 + 18*A*a*b*c*d))/2 + A*a*b*c*d*g^2*i^2))/(60*b*d)
 + (g^2*i^2*(3*A*a^3*d^3 + 3*A*b^3*c^3 + B*a^3*d^3 - B*b^3*c^3 + 27*A*a*b^2
*c^2*d + 27*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2))/(6*b*d) - (
a*c*((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d - B*b*c))/5 - (A*b*d*g^2*i^2
*(30*a*d + 30*b*c))/30))/(2*b*d)) + x^4*((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c
+ B*a*d - B*b*c))/20 - (A*b*d*g^2*i^2*(30*a*d + 30*b*c))/120) + (log(a + b*
x)*(B*a^5*d^2*g^2*i^2 + 10*B*a^3*b^2*c^2*g^2*i^2 - 5*B*a^4*b*c*d*g^2*i^2))/
(30*b^3) - (log(c + d*x)*(B*b^2*c^5*g^2*i^2 + 10*B*a^2*c^3*d^2*g^2*i^2 - 5*
B*a*b*c^4*d*g^2*i^2))/(30*d^3) + (A*b^2*d^2*g^2*i^2*x^5)/5
```

3.12 $\int (ag+bgx)(ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=239

$$\frac{B(bc-ad)^3gi^2x}{12b^2d}+\frac{B(bc-ad)^2gi^2(c+dx)^2}{24bd^2}-\frac{B(bc-ad)gi^2(c+dx)^3}{12d^2}+\frac{B(bc-ad)^4gi^2\log\left(\frac{a+bx}{c+dx}\right)}{12b^3d^2}-\frac{(bc-ad)}{}$$

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

Rubi [A]
time = 0.14, antiderivative size = 239, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.132$, Rules used = {2562, 45, 2382, 12, 78}

$$-\frac{gi^2(c+dx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d^2}+\frac{bgi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^2}+\frac{Bgi^2(bc-ad)^4\log\left(\frac{a+bx}{c+dx}\right)}{12b^3d^2}+\frac{Bgi^2(bc-ad)^4\log(c+dx)}{12b^3d^2}+\frac{Bgi^2x(bc-ad)^3}{12b^2d}+\frac{Bgi^2(c+dx)^2(bc-ad)^2}{24bd^2}-\frac{Bgi^2(c+dx)^3(bc-ad)}{12d^2}$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 45

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

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
```

```
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (12c+12dx)^2(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int \left(\frac{(-bc+ad)g(12c+12dx)^2\left(A+B\log\left(\right.\right.}{d}\right.$$

$$= \frac{(bg)\int(12c+12dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)d}{12d}$$

$$= -\frac{48(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{d^2}$$

$$= -\frac{48(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{d^2}$$

$$= -\frac{48(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{d^2}$$

$$= \frac{12B(bc-ad)^3gx}{b^2d}+\frac{6B(bc-ad)^2g(c+dx)^2}{bd^2}$$

Mathematica [A]

time = 0.13, size = 216, normalized size = 0.90

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

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 4029 vs. $2(225) = 450$.
time = 0.59, size = 4030, normalized size = 16.86

method	result
risch	$\frac{g\,i^2 Bx(3b\,d^2x^3+4x^2a\,d^2+8bcd\,x^2+12acdx+6b\,c^2x+12c^2a)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{12}+\frac{i^2gb\,d^2A\,x^4}{4}+\frac{i^2g\,d^2Aa\,x^3}{3}+\frac{2i^2gbdAc\,x}{3}$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/d^2*e*(a*d-b*c)*(1/8*B*d^2*e*g*i^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)
^2*a^2*c-B*d^5/e*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d
/(d*x+c))^3/b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^2*c+B*d^4/e*g*i^2
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/b/(b*e-(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c^2+9/2*B*d^3*e*g*i^2*b*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*d)^4*a*c^2-3/4*B*d^6/e*g*i^2/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*
e/d+(a*d-b*c)*e/d/(d*x+c))^4/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^2*c+
3/4*B*d^5/e*g*i^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^4/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a*c^2+1/24*B*e*g*i^2*b^2/(
b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*c^3-A*d^2*e^2*g*i^2*(a^3*d^3-3*a^2*b
*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*(-1/3/d^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
d)^3+1/4*b*e/d^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4)+1/12*B*d^3*e^2*g*
i^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^3-1/12*B*d^3*g*i^2/b^2/(b*e-(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^3-1/12*B*e^2*g*i^2/(b*e-(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*d)^3*b^3*c^3-1/4*B*d*g*i^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
d)*a*c^2+1/12*B*d^3/e*g*i^2/b^3*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^3
```

```
-1/24*B*d^3*e*g*i^2/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a^3+1/4*B*d^2
*g*i^2/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^2*c+1/3*B*d^6/e*g*i^2*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/b^3/(b*e-(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^3+1/4*B*d^7/e*g*i^2/b^3*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*d)^4*a^3+B*d^4*e*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)
*e/d/(d*x+c))/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^3+1/12*B*g*i^2*b/
(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*c^3-1/12*B/e*g*i^2*ln(b*e-(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*d)*c^3-B*d^5*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))^2/b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^3+
B*d^3*g*i^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))
^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*c^3-1/8*B*d*e*g*i^2*b/(b*e-(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a*c^2-1/4*B*d^4/e*g*i^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*d)^4*c^3-B*d^4*e^2*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c
)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^3+1/4*B*d/e*g*i^2/
b*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a*c^2-3*B*d^4*g*i^2*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*d)^4*a*c^2+B*d^2*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2*b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*c^3-B*d^6*
g*i^2/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/(
b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^3-1/4*B*d^2/e*g*i^2/b^2*ln(b*e-(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^2*c-1/3*B*d^3/e*g*i^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*d)^3*c^3-3*B*d^3*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c^2-1/4*B*d^2*e^2*
g*i^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^2*b*c-3*B*d^3*e*g*i^2*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*d)^3*a^2*c+B*d*e^2*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*b^3*c^
3+3/2*B*d^5*e*g*i^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^3+3*B*d^4*g*i^2*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/b/(b*e-(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*d)^3*a^2*c-9/2*B*d^4*e*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)
^4*a^2*c+3*B*d^5*g*i^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^2*c-3/2*B*d^2*e*g*i
^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e
-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*c^3-B*d*e*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*d)^3*c^3+3*B*d^2*e*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c^2+1/4*B*d*e^2*
g*i^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*b^2*c^2-3*B*d^2*e^2*g*i^2*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*d)^4*a*b^2*c^2+3*B*d^3*e^2*g*i^2*ln(b*e/d+(a*d-b*c)*e/
```

```
d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*d)^4*a^2*b*c)
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 651 vs. $2(206) = 412$.
time = 0.30, size = 651, normalized size = 2.72

$$-\frac{1}{4}Abd^2gx^4 - \frac{2}{3}Abcdgx^3 - \frac{1}{3}Aad^2gx^3 - \frac{1}{2}Abc^2gx^2 - Aacdgx^2 - \left(x\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)Bac^2g - \frac{1}{2}\left(x^2\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right) - \frac{a^2\log(bx+a)}{b^2} + \frac{c^2\log(dx+c)}{d^2} - \frac{(bc-ad)x}{bd}\right)Bbc^2g - \left(x^2\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right) - \frac{a^2\log(bx+a)}{b^2} + \frac{c^2\log(dx+c)}{d^2} - \frac{(bc-ad)x}{bd}\right)Bacdg - \frac{1}{3}\left(2x^3\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right) + \frac{2a^3\log(bx+a)}{b^3} - \frac{2c^3\log(dx+c)}{d^3} - \frac{(b^2cd-abd^2)x^2 - 2(b^2c^2-a^2d^2)x}{b^2d^2}\right)Bbcdg - \frac{1}{6}\left(2x^3\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right) + \frac{2a^3\log(bx+a)}{b^3} - \frac{2c^3\log(dx+c)}{d^3} - \frac{(b^2cd-abd^2)x^2 - 2(b^2c^2-a^2d^2)x}{b^2d^2}\right)Bad^2g - \frac{1}{24}\left(6x^4\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right) - \frac{6a^4\log(bx+a)}{b^4} + \frac{6c^4\log(dx+c)}{d^4} - \frac{2(b^3cd^2-ab^2d^3)x^3 - 3(b^3c^2d-a^2bd^3)x^2 + 6(b^3c^3-a^3d^3)x}{b^3d^3}\right)Bbd^2g - Aac^2gx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [**A**]
time = 0.43, size = 344, normalized size = 1.44

$$-\frac{6Ab^4d^4gx^4 + 2\left((8A-B)b^4cd^3 + (4A+B)ab^3d^4\right)gx^3 + \left((12A-5B)b^4c^2d^2 + 4(6A+B)ab^3cd^3 + Ba^2b^2d^4\right)gx^2 - 2\left(Bb^4c^3d - 2(6A-B)ab^3c^2d^2 - 4Ba^2b^2cd^3 + Ba^3bd^4\right)gx + 2\left(6Ba^2b^2c^2d^2 - 4Ba^3bcd^3 + Ba^4d^4\right)g\log\left(\frac{bx+a}{b}\right) + 2\left(Bb^4c^4 - 4Bab^3c^3d\right)g\log\left(\frac{dx+c}{d}\right) + 2\left(3Bb^4d^4gx^4 + 12Bab^3c^2d^2gx + 4\left(2Bb^4cd^3 + Bab^3d^4\right)gx^3 + 6\left(Bb^4c^2d^2 + 2Bab^3cd^3\right)gx^2\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{24b^3d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 850 vs. $2(221) = 442$.
time = 2.77, size = 850, normalized size = 3.56

$$\frac{Abd^2gi^2x^4}{4} + \frac{Ba^2gi^2(a^2d^2 - 4abcd + 6b^2c^2)\log\left(x + \frac{Ba^4cd^3gi^2 - 4Ba^3bc^2d^2gi^2 + \frac{Ba^3d^2gi^2(a^2d^2-4abcd+6b^2c^2)}{b} + 10Ba^2b^2c^3dgi^2 - Ba^2cdgi^2(a^2d^2-4abcd+6b^2c^2) - Bab^3c^4gi^2}{Ba^4d^4gi^2 - 4Ba^3bcd^3gi^2 + 6Ba^2b^2c^2d^2gi^2 + 4Bab^3c^3dgi^2 - Bb^4c^4gi^2}\right)}{12b^3} - \frac{Bc^3gi^2\cdot(4ad - bc)\log\left(x + \frac{Ba^4cd^3gi^2 - 4Ba^3bc^2d^2gi^2 + 10Ba^2b^2c^3dgi^2 - Bab^3c^4gi^2 - Bab^2c^3gi^2\cdot(4ad-bc) + \frac{Bb^3c^4gi^2\cdot(4ad-bc)}{d}}{Ba^4d^4gi^2 - 4Ba^3bcd^3gi^2 + 6Ba^2b^2c^2d^2gi^2 + 4Bab^3c^3dgi^2 - Bb^4c^4gi^2}\right)}{12d^2} + x^3\left(\frac{Aad^2gi^2}{3} + \frac{2Abcdgi^2}{3} + \frac{Bad^2gi^2}{12} - \frac{Bbcdgi^2}{12}\right) + x^2\left(Aacdgi^2 + \frac{Abc^2gi^2}{2} + \frac{Ba^2d^2gi^2}{24b} + \frac{Bacdgi^2}{6} - \frac{5Bbc^2gi^2}{24}\right) + x\left(Aac^2gi^2 - \frac{Ba^3d^2gi^2}{12b^2} + \frac{Ba^2cdgi^2}{3b} - \frac{Bac^2gi^2}{6} - \frac{Bbc^3gi^2}{12d}\right) + \left(Bac^2gi^2x + Bacdgi^2x^2 + \frac{Bad^2gi^2x^3}{3} + \frac{Bbc^2gi^2x^2}{2} + \frac{2Bbcdgi^2x^3}{3} + \frac{Bbd^2gi^2x^4}{4}\right)\log\left(\frac{e(a+bx)}{c+dx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 3856 vs. $2(206) = 412$.
time = 3.76, size = 3856, normalized size = 16.13

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(2*B*b^9*c^5*g*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 10*B*a*b^8*
c^4*d*g*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 20*B*a^2*b^7*c^3*d^2*g*
e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 20*B*a^3*b^6*c^2*d^3*g*e^5*log(
-b*e + (b*x*e + a*e)*d/(d*x + c)) + 10*B*a^4*b^5*c*d^4*g*e^5*log(-b*e + (b*
x*e + a*e)*d/(d*x + c)) - 2*B*a^5*b^4*d^5*g*e^5*log(-b*e + (b*x*e + a*e)*d/
(d*x + c)) - 8*(b*x*e + a*e)*B*b^8*c^5*d*g*e^4*log(-b*e + (b*x*e + a*e)*d/(
d*x + c))/(d*x + c) + 40*(b*x*e + a*e)*B*a*b^7*c^4*d^2*g*e^4*log(-b*e + (b*
```

```
x*e + a*e)*d/(d*x + c))/(d*x + c) - 80*(b*x*e + a*e)*B*a^2*b^6*c^3*d^3*g*e^
4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 80*(b*x*e + a*e)*B*a^3*
b^5*c^2*d^4*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 40*(b*x
*e + a*e)*B*a^4*b^4*c*d^5*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
+ c) + 8*(b*x*e + a*e)*B*a^5*b^3*d^6*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c) + 12*(b*x*e + a*e)^2*B*b^7*c^5*d^2*g*e^3*log(-b*e + (b*x*e
+ a*e)*d/(d*x + c))/(d*x + c)^2 - 60*(b*x*e + a*e)^2*B*a*b^6*c^4*d^3*g*e^3*
log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 120*(b*x*e + a*e)^2*B*a
^2*b^5*c^3*d^4*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 12
0*(b*x*e + a*e)^2*B*a^3*b^4*c^2*d^5*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x +
 c))/(d*x + c)^2 + 60*(b*x*e + a*e)^2*B*a^4*b^3*c*d^6*g*e^3*log(-b*e + (b*x
*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 12*(b*x*e + a*e)^2*B*a^5*b^2*d^7*g*e^3
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 8*(b*x*e + a*e)^3*B*b^
6*c^5*d^3*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 40*(b*x
*e + a*e)^3*B*a*b^5*c^4*d^4*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*
x + c)^3 - 80*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g*e^2*log(-b*e + (b*x*e + a
*e)*d/(d*x + c))/(d*x + c)^3 + 80*(b*x*e + a*e)^3*B*a^3*b^3*c^2*d^6*g*e^2*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 40*(b*x*e + a*e)^3*B*a^4
*b^2*c*d^7*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 8*(b*x
*e + a*e)^3*B*a^5*b*d^8*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x +
c)^3 + 2*(b*x*e + a*e)^4*B*b^5*c^5*d^4*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^4 - 10*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*g*e*log(-b*e + (b*x*
e + a*e)*d/(d*x + c))/(d*x + c)^4 + 20*(b*x*e + a*e)^4*B*a^2*b^3*c^3*d^6*g*
e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 20*(b*x*e + a*e)^4*B*
a^3*b^2*c^2*d^7*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 10*
(b*x*e + a*e)^4*B*a^4*b*c*d^8*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*
x + c)^4 - 2*(b*x*e + a*e)^4*B*a^5*d^9*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^4 - 12*(b*x*e + a*e)^2*B*b^7*c^5*d^2*g*e^3*log((b*x*e + a*e
)/(d*x + c))/(d*x + c)^2 + 60*(b*x*e + a*e)^2*B*a*b^6*c^4*d^3*g*e^3*log((b*
x*e + a*e)/(d*x + c))/(d*x + c)^2 - 120*(b*x*e + a*e)^2*B*a^2*b^5*c^3*d^4*g
*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 120*(b*x*e + a*e)^2*B*a^3*b
^4*c^2*d^5*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 60*(b*x*e + a*e
)^2*B*a^4*b^3*c*d^6*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 12*(b*
x*e + a*e)^2*B*a^5*b^2*d^7*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 +
 8*(b*x*e + a*e)^3*B*b^6*c^5*d^3*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x +
c)^3 - 40*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g*e^2*log((b*x*e + a*e)/(d*x + c)
)/(d*x + c)^3 + 80*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g*e^2*log((b*x*e + a*e
)/(d*x + c))/(d*x + c)^3 - 80*(b*x*e + a*e)^3*B*a^3*b^3*c^2*d^6*g*e^2*log((
b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 40*(b*x*e + a*e)^3*B*a^4*b^2*c*d^7*g*
e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 8*(b*x*e + a*e)^3*B*a^5*b*d^
8*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 2*(b*x*e + a*e)^4*B*b^5*
c^5*d^4*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 10*(b*x*e + a*e)^4*B
*a*b^4*c^4*d^5*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 20*(b*x*e + a
*e)^4*B*a^2*b^3*c^3*d^6*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 20*(
b*x*e + a*e)^4*B*a^3*b^2*c^2*d^7*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)
```

```
^4 - 10*(b*x*e + a*e)^4*B*a^4*b*c*d^8*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x
 + c)^4 + 2*(b*x*e + a*e)^4*B*a^5*d^9*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x
 + c)^4 + 2*A*b^9*c^5*g*e^5 - B*b^9*c^5*g*e^5 - 10*A*a*b^8*c^4*d*g*e^5 + 5*
B*a*b^8*c^4*d*g*e^5 + 20*A*a^2*b^7*c^3*d^2*g*e^5 - 10*B*a^2*b^7*c^3*d^2*g*e
^5 - 20*A*a^3*b^6*c^2*d^3*g*e^5 + 10*B*a^3*b^6*c^2*d^3*g*e^5 + 10*A*a^4*b^5
*c*d^4*g*e^5 - 5*B*a^4*b^5*c*d^4*g*e^5 - 2*A*a^5*b^4*d^5*g*e^5 + B*a^5*b^4*
d^5*g*e^5 - 8*(b*x*e + a*e)*A*b^8*c^5*d*g*e^4/(d*x + c) + 6*(b*x*e + a*e)*B
*b^8*c^5*d*g*e^4/(d*x + c) + 40*(b*x*e + a*e)*A*a*b^7*c^4*d^2*g*e^4/(d*x +
c) - 30*(b*x*e + a*e)*B*a*b^7*c^4*d^2*g*e^4/(d*x + c) - 80*(b*x*e + a*e)*A*
a^2*b^6*c^3*d^3*g*e^4/(d*x + c) + 60*(b*x*e + a*e)*B*a^2*b^6*c^3*d^3*g*e^4/
(d*x + c) + 80*(b*x*e + a*e)*A*a^3*b^5*c^2*d^4*g*e^4/(d*x + c) - 60*(b*x*e
+ a*e)*B*a^3*b^5*c^2*d^4*g*e^4/(d*x + c) - 40*(b*x*e + a*e)*A*a^4*b^4*c*d^5
*g*e^4/(d*x + c) + 30*(b*x*e + a*e)*B*a^4*b^4*c*d^5*g*e^4/(d*x + c) + 8*(b*
x*e + a*e)*A*a^5*b^3*d^6*g*e^4/(d*x + c) - 6*(b*x*e + a*e)*B*a^5*b^3*d^6*g*
e^4/(d*x + c) - 7*(b*x*e + a*e)^2*B*b^7*c^5*d^2...
```

Mupad [B]
time = 5.00, size = 636, normalized size = 2.66

$$x^3\left(\frac{d g i^2 (8Aad+12Abc+Bad-Bbc)}{12}-\frac{A d g i^2(12ad+12bc)}{36}\right)-x^2\left(\frac{\left(\frac{dgi^2(8Aad+12Abc+Bad-Bbc)}{4}-\frac{Adgi^2(12ad+12bc)}{12}\right)(12ad+12bc)}{24bd}-\frac{gi^2(3Aa^2d^2+9Ab^2c^2+Ba^2d^2-2Bb^2c^2+18Aabcd+Babcd)}{6b}+\frac{Aacdgi^2}{2}\right)+\ln\left(\frac{e(a+bx)}{c+dx}\right)\left(Bac^2gi^2x+\frac{Bcgi^2x^2(2ad+bc)}{2}+\frac{Bdgi^2x^3(ad+2bc)}{3}+\frac{Bbd^2gi^2x^4}{4}\right)+x\left(\frac{(12ad+12bc)\left(\frac{\left(\frac{dgi^2(8Aad+12Abc+Bad-Bbc)}{4}-\frac{Adgi^2(12ad+12bc)}{12}\right)(12ad+12bc)}{12bd}-\frac{gi^2(3Aa^2d^2+9Ab^2c^2+Ba^2d^2-2Bb^2c^2+18Aabcd+Babcd)}{3b}+Aacdgi^2\right)}{12bd}-\frac{ac\left(\frac{dgi^2(8Aad+12Abc+Bad-Bbc)}{4}-\frac{Adgi^2(12ad+12bc)}{12}\right)}{bd}+\frac{cgi^2(6Aa^2d^2+2Ab^2c^2+2Ba^2d^2-Bb^2c^2+12Aabcd-Babcd)}{2bd}\right)+\frac{\ln(a+bx)\,(Bga^4d^2i^2-4Bga^3bcdi^2+6Bga^2b^2c^2i^2)}{12b^3}+\frac{\ln(c+dx)\,(Bbc^4gi^2-4Bac^3dgi^2)}{12d^2}+\frac{Abd^2gi^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^3*((d*g*i^2*(8*A*a*d + 12*A*b*c + B*a*d - B*b*c))/12 - (A*d*g*i^2*(12*a*d
 + 12*b*c))/36) - x^2*((((d*g*i^2*(8*A*a*d + 12*A*b*c + B*a*d - B*b*c))/4 -
 (A*d*g*i^2*(12*a*d + 12*b*c))/12)*(12*a*d + 12*b*c))/(24*b*d) - (g*i^2*(3*
A*a^2*d^2 + 9*A*b^2*c^2 + B*a^2*d^2 - 2*B*b^2*c^2 + 18*A*a*b*c*d + B*a*b*c*
d))/(6*b) + (A*a*c*d*g*i^2)/2) + log((e*(a + b*x))/(c + d*x))*(B*a*c^2*g*i^
2*x + (B*c*g*i^2*x^2*(2*a*d + b*c))/2 + (B*d*g*i^2*x^3*(a*d + 2*b*c))/3 + (
B*b*d^2*g*i^2*x^4)/4) + x*(((12*a*d + 12*b*c)*((((d*g*i^2*(8*A*a*d + 12*A*b
*c + B*a*d - B*b*c))/4 - (A*d*g*i^2*(12*a*d + 12*b*c))/12)*(12*a*d + 12*b*c
))/(12*b*d) - (g*i^2*(3*A*a^2*d^2 + 9*A*b^2*c^2 + B*a^2*d^2 - 2*B*b^2*c^2 +
 18*A*a*b*c*d + B*a*b*c*d))/(3*b) + A*a*c*d*g*i^2))/(12*b*d) - (a*c*((d*g*i
^2*(8*A*a*d + 12*A*b*c + B*a*d - B*b*c))/4 - (A*d*g*i^2*(12*a*d + 12*b*c))/
12))/(b*d) + (c*g*i^2*(6*A*a^2*d^2 + 2*A*b^2*c^2 + 2*B*a^2*d^2 - B*b^2*c^2
+ 12*A*a*b*c*d - B*a*b*c*d))/(2*b*d)) + (log(a + b*x)*(B*a^4*d^2*g*i^2 + 6*
B*a^2*b^2*c^2*g*i^2 - 4*B*a^3*b*c*d*g*i^2))/(12*b^3) + (log(c + d*x)*(B*b*c
^4*g*i^2 - 4*B*a*c^3*d*g*i^2))/(12*d^2) + (A*b*d^2*g*i^2*x^4)/4
```

3.13 $\int (ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=118

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

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

Rubi [A]
time = 0.05, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2548, 21, 45}

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

Antiderivative was successfully verified.

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

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

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

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

Rule 2548

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*(
(A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*(m + 1))), x] - Dist[B*n*((b*c
```

```
- a*d)/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /;
 FreeQ[{a, b, c, d, e, f, g, A, B, m, n}, x] && EqQ[n + mn, 0] && NeQ[b*c -
 a*d, 0] && NeQ[m, -1] &&  !(EqQ[m, -2] && IntegerQ[n])
```

Rubi steps

$$\int (13c+13dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \frac{169(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d} - \frac{B\int\frac{2197(bc-ad)(c+d}{a+bx}}{39d}$$

$$= \frac{169(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d} - \frac{(169B(bc-ad))}{3d}$$

$$= \frac{169(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d} - \frac{(169B(bc-ad))}{}$$

$$= -\frac{169B(bc-ad)^2x}{3b^2} - \frac{169B(bc-ad)(c+dx)^2}{6bd} - \frac{169B(}{}$$

Mathematica [A]
time = 0.03, size = 97, normalized size = 0.82

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

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1498 vs. $2(110) = 220$.
time = 0.58, size = 1499, normalized size = 12.70

method	result
risch	$\frac{i^2(dx+c)^3B\ln\left(\frac{e(bx+a)}{dx+c}\right)}{3d}+\frac{i^2d^2A\,x^3}{3}+i^2dAc\,x^2+\frac{i^2d^2Ba\,x^2}{6b}-\frac{i^2dBc\,x^2}{6}+i^2A\,c^2x+\frac{i^2d^2B\ln(bx+a)a}{3b^3}$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 272 vs. $2(99) = 198$.
time = 0.28, size = 272, normalized size = 2.31

$$-\frac{1}{3}\,Ad^2x^3 - Acdx^2 - \left(x\log\left(\frac{bxe}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log\left(bx+a\right)}{b} - \frac{c\log\left(dx+c\right)}{d}\right)Bc^2 - \left(x^2\log\left(\frac{bxe}{dx+c} + \frac{ae}{dx+c}\right) - \frac{a^2\log\left(bx+a\right)}{b^2} + \frac{c^2\log\left(dx+c\right)}{d^2} - \frac{(bc-ad)x}{bd}\right)Bcd - \frac{1}{6}\left(2\,x^3\log\left(\frac{bxe}{dx+c} + \frac{ae}{dx+c}\right) + \frac{2\,a^3\log\left(bx+a\right)}{b^3} - \frac{2\,c^3\log\left(dx+c\right)}{d^3} - \frac{(b^2cd - abd^2)x^2 - 2\,(b^2c^2 - a^2d^2)x}{b^2d^2}\right)Bd^2 - Ac^2x$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 206 vs. $2(99) = 198$.
time = 0.41, size = 206, normalized size = 1.75

$$-\frac{2\,Ab^3d^3x^3 - 2\,Bb^3c^3\log\left(\frac{dx+c}{d}\right) + ((6\,A-B)b^3cd^2 + Bab^2d^3)x^2 + 2\,((3\,A-2\,B)b^3c^2d + 3\,Bab^2cd^2 - Ba^2bd^3)x + 2\,(Bb^3d^3x^3 + 3\,Bb^3cd^2x^2 + 3\,Bb^3c^2dx)\log\left(\frac{(bx+a)e}{dx+c}\right) + 2\,(3\,Bab^2c^2d - 3\,Ba^2bcd^2 + Ba^3d^3)\log\left(\frac{bx+a}{b}\right)}{6\,b^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 491 vs. $2(100) = 200$.
time = 1.53, size = 491, normalized size = 4.16

$$\frac{Ad^2i^2x^3}{3} + \frac{Bai^2(a^2d^2 - 3abcd + 3b^2c^2)\log\left(x + \frac{Ba^3cd^2i^2 - 3Ba^2bc^2di^2 + \frac{Ba^2di^2(a^2d^2-3abcd+3b^2c^2)}{b} + 4Bab^2c^3i^2 - Baci^2(a^2d^2-3abcd+3b^2c^2)}{Ba^3d^3i^2 - 3Ba^2bcd^2i^2 + 3Bab^2c^2di^2 + Bb^3c^3i^2}\right)}{3b^3} - \frac{Bc^3i^2\log\left(x + \frac{Ba^3cd^2i^2 - 3Ba^2bc^2di^2 + 3Bab^2c^3i^2 + \frac{Bb^3c^4i^2}{d}}{Ba^3d^3i^2 - 3Ba^2bcd^2i^2 + 3Bab^2c^2di^2 + Bb^3c^3i^2}\right)}{3d} + x^2\left(Acdi^2 + \frac{Bad^2i^2}{6b} - \frac{Bcdi^2}{6}\right) + x\left(Ac^2i^2 - \frac{Ba^2d^2i^2}{3b^2} + \frac{Bacdi^2}{b} - \frac{2Bc^2i^2}{3}\right) + \left(Bc^2i^2x + Bcdi^2x^2 + \frac{Bd^2i^2x^3}{3}\right)\log\left(\frac{e(a+bx)}{c+dx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 2475 vs. $2(99) = 198$.
time = 5.05, size = 2475, normalized size = 20.97

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*(2*B*b^7*c^4*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 8*B*a*b^6*c^3
*d*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 12*B*a^2*b^5*c^2*d^2*e^4*log
(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 8*B*a^3*b^4*c*d^3*e^4*log(-b*e + (b*x*
e + a*e)*d/(d*x + c)) + 2*B*a^4*b^3*d^4*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x
 + c)) - 6*(b*x*e + a*e)*B*b^6*c^4*d*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x +
c))/(d*x + c) + 24*(b*x*e + a*e)*B*a*b^5*c^3*d^2*e^3*log(-b*e + (b*x*e + a*
```

```
e)*d/(d*x + c))/(d*x + c) - 36*(b*x*e + a*e)*B*a^2*b^4*c^2*d^3*e^3*log(-b*e
 + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 24*(b*x*e + a*e)*B*a^3*b^3*c*d^4*
e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 6*(b*x*e + a*e)*B*a^4
*b^2*d^5*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 6*(b*x*e + a
*e)^2*B*b^5*c^4*d^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 -
 24*(b*x*e + a*e)^2*B*a*b^4*c^3*d^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c
))/(d*x + c)^2 + 36*(b*x*e + a*e)^2*B*a^2*b^3*c^2*d^4*e^2*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^2 - 24*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*e^2*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 6*(b*x*e + a*e)^2*B*a^4*
b*d^6*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 2*(b*x*e + a*
e)^3*B*b^4*c^4*d^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 8*
(b*x*e + a*e)^3*B*a*b^3*c^3*d^4*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*
x + c)^3 - 12*(b*x*e + a*e)^3*B*a^2*b^2*c^2*d^5*e*log(-b*e + (b*x*e + a*e)*
d/(d*x + c))/(d*x + c)^3 + 8*(b*x*e + a*e)^3*B*a^3*b*c*d^6*e*log(-b*e + (b*
x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 2*(b*x*e + a*e)^3*B*a^4*d^7*e*log(-b*
e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 6*(b*x*e + a*e)*B*b^6*c^4*d*e^
3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 24*(b*x*e + a*e)*B*a*b^5*c^3*d^2
*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 36*(b*x*e + a*e)*B*a^2*b^4*c^
2*d^3*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 24*(b*x*e + a*e)*B*a^3*b
^3*c*d^4*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 6*(b*x*e + a*e)*B*a^4
*b^2*d^5*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 6*(b*x*e + a*e)^2*B*b
^5*c^4*d^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 24*(b*x*e + a*e)^
2*B*a*b^4*c^3*d^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 36*(b*x*e
+ a*e)^2*B*a^2*b^3*c^2*d^4*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 2
4*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c
)^2 - 6*(b*x*e + a*e)^2*B*a^4*b*d^6*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x +
 c)^2 + 2*(b*x*e + a*e)^3*B*b^4*c^4*d^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x
 + c)^3 - 8*(b*x*e + a*e)^3*B*a*b^3*c^3*d^4*e*log((b*x*e + a*e)/(d*x + c))/
(d*x + c)^3 + 12*(b*x*e + a*e)^3*B*a^2*b^2*c^2*d^5*e*log((b*x*e + a*e)/(d*x
 + c))/(d*x + c)^3 - 8*(b*x*e + a*e)^3*B*a^3*b*c*d^6*e*log((b*x*e + a*e)/(d
*x + c))/(d*x + c)^3 + 2*(b*x*e + a*e)^3*B*a^4*d^7*e*log((b*x*e + a*e)/(d*x
 + c))/(d*x + c)^3 + 2*A*b^7*c^4*e^4 - 3*B*b^7*c^4*e^4 - 8*A*a*b^6*c^3*d*e^
4 + 12*B*a*b^6*c^3*d*e^4 + 12*A*a^2*b^5*c^2*d^2*e^4 - 18*B*a^2*b^5*c^2*d^2*
e^4 - 8*A*a^3*b^4*c*d^3*e^4 + 12*B*a^3*b^4*c*d^3*e^4 + 2*A*a^4*b^3*d^4*e^4
- 3*B*a^4*b^3*d^4*e^4 + 5*(b*x*e + a*e)*B*b^6*c^4*d*e^3/(d*x + c) - 20*(b*x
*e + a*e)*B*a*b^5*c^3*d^2*e^3/(d*x + c) + 30*(b*x*e + a*e)*B*a^2*b^4*c^2*d^
3*e^3/(d*x + c) - 20*(b*x*e + a*e)*B*a^3*b^3*c*d^4*e^3/(d*x + c) + 5*(b*x*e
 + a*e)*B*a^4*b^2*d^5*e^3/(d*x + c) - 2*(b*x*e + a*e)^2*B*b^5*c^4*d^2*e^2/(
d*x + c)^2 + 8*(b*x*e + a*e)^2*B*a*b^4*c^3*d^3*e^2/(d*x + c)^2 - 12*(b*x*e
+ a*e)^2*B*a^2*b^3*c^2*d^4*e^2/(d*x + c)^2 + 8*(b*x*e + a*e)^2*B*a^3*b^2*c*
d^5*e^2/(d*x + c)^2 - 2*(b*x*e + a*e)^2*B*a^4*b*d^6*e^2/(d*x + c)^2)*(b*c/(
(b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b^6*d*e^
3 - 3*(b*x*e + a*e)*b^5*d^2*e^2/(d*x + c) + 3*(b*x*e + a*e)^2*b^4*d^3*e/(d*
x + c)^2 - (b*x*e + a*e)^3*b^3*d^4/(d*x + c)^3)
```

Mupad [B]

time = 4.59, size = 290, normalized size = 2.46

$$x^2\left(\frac{d\,i^2\,\left(3\,A\,a\,d+9\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{6\,b}-\frac{A\,d\,i^2\,\left(3\,a\,d+3\,b\,c\right)}{6\,b}\right)-x\left(\frac{\left(3\,a\,d+3\,b\,c\right)\,\left(\frac{d\,i^2\,\left(3\,A\,a\,d+9\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{3\,b}-\frac{A\,d\,i^2\,\left(3\,a\,d+3\,b\,c\right)}{3\,b}\right)}{3\,b\,d}-\frac{c\,i^2\,\left(3\,A\,a\,d+3\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{b}+\frac{A\,a\,c\,d\,i^2}{b}\right)+\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(B\,c^2\,i^2\,x+B\,c\,d\,i^2\,x^2+\frac{B\,d^2\,i^2\,x^3}{3}\right)+\frac{\ln\left(a+b\,x\right)\,\left(B\,a^3\,d^2\,i^2-3\,B\,a^2\,b\,c\,d\,i^2+3\,B\,a\,b^2\,c^2\,i^2\right)}{3\,b^3}+\frac{A\,d^2\,i^2\,x^3}{3}-\frac{B\,c^3\,i^2\,\ln\left(c+d\,x\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.14 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=276

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

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

Rubi [A]
time = 0.24, antiderivative size = 276, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2562, 2389, 2379, 2438, 2351, 31, 2356, 46}

$$\frac{Bi^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g}+\frac{di^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g}-\frac{i^2(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g}+\frac{i^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2bg}-\frac{Bi^2(bc-ad)^2\log\left(\frac{a+bx}{c+dx}\right)}{2b^3g}-\frac{3Bi^2(bc-ad)^2\log(c+dx)}{2b^3g}-\frac{Bdi^2x(bc-ad)}{2b^2g}$$

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 46

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

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

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(14c+14dx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx = \int \left(\frac{196d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g} + \frac{14d(14c+14dx)\ldots}{\ldots}\right.$$

$$= \frac{(196(bc-ad)^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ag+bgx}\,dx}{b^2} + \frac{(14d)\int (14c+14dx)\left(\ldots\right.}{\ldots}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} + \frac{98(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg} + \frac{196\ldots}{\ldots}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} + \frac{196Bd(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g} + \ldots$$

$$= \frac{196Ad(bc-ad)x}{b^2g} + \frac{196Bd(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g} + \ldots$$

$$= \frac{196Ad(bc-ad)x}{b^2g} - \frac{98Bd(bc-ad)x}{b^2g} - \frac{98B(bc-ad)^2\log(a+\ldots}{b^3g}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} - \frac{98Bd(bc-ad)x}{b^2g} - \frac{98B(bc-ad)^2\log(a+\ldots}{b^3g}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} - \frac{98Bd(bc-ad)x}{b^2g} - \frac{98B(bc-ad)^2\log(a+\ldots}{b^3g}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} - \frac{98Bd(bc-ad)x}{b^2g} - \frac{98B(bc-ad)^2\log(a+\ldots}{b^3g}$$

Mathematica [A]
time = 0.13, size = 252, normalized size = 0.91

$$\frac{i^2\left(2Abd(bc-ad)x - B(bc-ad)(bdx+(bc-ad)\log(a+bx)) + 2Bd(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right) + b^2(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) + 2(bc-ad)^2\log(g(a+bx))\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) - 2B(bc-ad)^2\log(c+dx) + B(bc-ad)^2\left(-\log(g(a+bx))\left(\log(g(a+bx)) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) + 2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{2b^3g}$$

Antiderivative was successfully verified.

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

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

```
B*(b*c - a*d)^2*(-(Log[g*(a + b*x)]*(Log[g*(a + b*x)] - 2*Log[(b*(c + d*x))
/(b*c - a*d)])) + 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(2*b^3*g)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1689 vs. $2(268) = 536$.
time = 1.38, size = 1690, normalized size = 6.12

method	result	size
derivativedivides	Expression too large to display	1690
default	Expression too large to display	1690
risch	Expression too large to display	3116

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A]

time = 0.33, size = 395, normalized size = 1.43

$$-2\,Acd\left(\frac{x}{bg}-\frac{a\log\left(bx+a\right)}{b^{2}g}\right)-\frac{1}{2}\,Ad^{2}\left(\frac{2\,a^{2}\log\left(bx+a\right)}{b^{3}g}+\frac{bx^{2}-2\,ax}{b^{2}g}\right)-\frac{Ac^{2}\log\left(bgx+ag\right)}{bg}+\frac{(3\,bc^{2}-2\,acd)B\log\left(dx+c\right)}{2\,b^{2}g}-\frac{(b^{2}c^{2}-2\,abcd+a^{2}d^{2})\left(\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_{2}\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{b^{3}g}-\frac{Bb^{2}d^{2}x^{2}+(b^{2}c^{2}-2\,abcd+a^{2}d^{2})B\log\left(bx+a\right)^{2}+(3\,b^{2}cd-abd^{2})Bx+(Bb^{2}d^{2}x^{2}+2\,(2\,b^{2}cd-abd^{2})Bx+(2\,b^{2}c^{2}-a^{2}d^{2})B)\log\left(bx+a\right)-(Bb^{2}d^{2}x^{2}+2\,(2\,b^{2}cd-abd^{2})Bx+2\,(b^{2}c^{2}-2\,abcd+a^{2}d^{2})B\log\left(bx+a\right))\log\left(dx+c\right)}{2\,b^{3}g}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{i^{2}\left(\int\frac{Ac^{2}}{a+bx}\,dx+\int\frac{Ad^{2}x^{2}}{a+bx}\,dx+\int\frac{Bc^{2}\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx+\int\frac{2Acdx}{a+bx}\,dx+\int\frac{Bd^{2}x^{2}\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx+\int\frac{2Bcdx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.15 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=247

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

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

Rubi [A]

time = 0.23, antiderivative size = 247, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2562, 46, 2393, 2341, 2351, 31, 2379, 2438}

$$\frac{2Bdi^2(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^2}+\frac{d^2i^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2}-\frac{2di^2(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2}-\frac{i^2(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^2(a+bx)}-\frac{Bdi^2(bc-ad)\log(c+dx)}{b^3g^2}-\frac{Bi^2(c+dx)(bc-ad)}{b^2g^2(a+bx)}$$

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 46

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

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2379

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

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(15c+15dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx = \int \left(\frac{225d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2} + \frac{225(bc-ad)^2\left(A+B\log\right.}{b^2g^2(a+bx)^2}\right.$$

$$= \frac{(225d^2)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{b^2g^2} + \frac{(450d(bc-ad))\int\frac{A+B}{}}{b^2g^2}$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^2(a+bx)} + \frac{450d(bc-}{}$$

$$= \frac{225Ad^2x}{b^2g^2} + \frac{225Bd^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g^2} - \frac{225(bc-ad)^2\left(A\right.}{b^3g^2(}$$

$$= \frac{225Ad^2x}{b^2g^2} + \frac{225Bd^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g^2} - \frac{225(bc-ad)^2\left(A\right.}{b^3g^2(}$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc-ad)^2}{b^3g^2(a+bx)} - \frac{225Bd(bc-ad)\log(a+bx)}{b^3g^2} +$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc-ad)^2}{b^3g^2(a+bx)} - \frac{225Bd(bc-ad)\log(a+bx)}{b^3g^2} +$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc-ad)^2}{b^3g^2(a+bx)} - \frac{225Bd(bc-ad)\log(a+bx)}{b^3g^2} -$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc-ad)^2}{b^3g^2(a+bx)} - \frac{225Bd(bc-ad)\log(a+bx)}{b^3g^2} -$$

Mathematica [A]
time = 0.16, size = 221, normalized size = 0.89

$$\frac{i^2\left(Abd^2x - \frac{B(bc-ad)^2}{a+bx} + Bd(-bc+ad)\log(a+bx) + Bd^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right) - \frac{(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx} + 2d(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) + Bd(-bc+ad)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{b^3g^2}$$

Antiderivative was successfully verified.

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

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

```
a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)]))/(b^3*g^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 681 vs. $2(247) = 494$.
time = 1.35, size = 682, normalized size = 2.76

method	result
derivativedivides	$-\frac{e(ad-cb)\left(-\frac{i^2d^2A}{g^2b^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}+\frac{2i^2d^3A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e\,g^2b^3}+\frac{i^2d^3A}{g^2b^2\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}-\frac{2i^2d^3A\ln\left(be-\left(\frac{be}{d}+\frac{(ad-}{d(d}\right.\right.}{e\,g^2b^3}\right.}{}$
default	$-\frac{e(ad-cb)\left(-\frac{i^2d^2A}{g^2b^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}+\frac{2i^2d^3A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e\,g^2b^3}+\frac{i^2d^3A}{g^2b^2\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}-\frac{2i^2d^3A\ln\left(be-\left(\frac{be}{d}+\frac{(ad-}{d(d}\right.\right.}{e\,g^2b^3}\right.}{}$
risch	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 783 vs. $2(229) = 458$.
time = 0.34, size = 783, normalized size = 3.17

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{(a\,g+b\,g\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.16 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=230

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

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

Rubi [A]

time = 0.21, antiderivative size = 230, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2562, 2380, 2341, 2379, 2438}

$$\frac{Bd^2i^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^3}-\frac{d^2i^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^3}-\frac{di^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^3(a+bx)}-\frac{i^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2bg^3(a+bx)^2}-\frac{Bdi^2(c+dx)}{b^2g^3(a+bx)}-\frac{Bi^2(c+dx)^2}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

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

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

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2379

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

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(16c+16dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx = \int \left(\frac{256(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^3(a+bx)^3} + \frac{512d(bc-ad)\left(A\right.}{b^2g^3(}\right.$$

$$= \frac{(256d^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{b^2g^3} + \frac{(512d(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx}{c+dx}\right.}{(a+bx)^2}}{b^2g^3}$$

$$= -\frac{128(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2} - \frac{512d(bc-ad)\left(A+\right.}{b^3g^3(a-}$$

$$= -\frac{128(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2} - \frac{512d(bc-ad)\left(A+\right.}{b^3g^3(a-}$$

$$= -\frac{128(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2} - \frac{512d(bc-ad)\left(A+\right.}{b^3g^3(a-}$$

$$= -\frac{64B(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{384Bd(bc-ad)}{b^3g^3(a+bx)} - \frac{384Bd^2\log(a+bx)}{b^3g^3} -$$

$$= -\frac{64B(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{384Bd(bc-ad)}{b^3g^3(a+bx)} - \frac{384Bd^2\log(a+bx)}{b^3g^3} -$$

$$= -\frac{64B(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{384Bd(bc-ad)}{b^3g^3(a+bx)} - \frac{384Bd^2\log(a+bx)}{b^3g^3} -$$

$$= -\frac{64B(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{384Bd(bc-ad)}{b^3g^3(a+bx)} - \frac{384Bd^2\log(a+bx)}{b^3g^3} -$$

Mathematica [A]
time = 0.21, size = 244, normalized size = 1.06

$$\frac{i^2\left(-\frac{B(bc-ad)^2}{(a+bx)^2}+\frac{6Bd(-bc+ad)}{a+bx}-6Bd^2\log(a+bx)-\frac{2(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)^2}+\frac{8d(-bc+ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx}+4d^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+6Bd^2\log(c+dx)-2Bd^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{4b^3g^3}$$

Antiderivative was successfully verified.

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

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

```
d^2*Log[c + d*x] - 2*B*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x)
)/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(4*b^3*g^3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 739 vs. $2(226) = 452$.

time = 1.41, size = 740, normalized size = 3.22

method	result
derivativedivides	$-\frac{e(ad-cb)\left(\frac{i^2 d^4 A \ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{e(ad-cb)g^3b^3}+\frac{i^2 d^2 eA}{2(ad-cb)g^3b\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}-\frac{i^2 d^4 A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e(ad-cb)g^3b^3}+\frac{i^2 d^3 \cdots}{(ad-cb)g^3b^2\left(\frac{b\cdots}{d}\cdots\right.} \cdots\right.}{\cdots}$
default	$-\frac{e(ad-cb)\left(\frac{i^2 d^4 A \ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{e(ad-cb)g^3b^3}+\frac{i^2 d^2 eA}{2(ad-cb)g^3b\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}-\frac{i^2 d^4 A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e(ad-cb)g^3b^3}+\frac{i^2 d^3 \cdots}{(ad-cb)g^3b^2\left(\frac{b\cdots}{d}\cdots\right.} \cdots\right.}{\cdots}$
risch	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*B*d^2*((4*a*b*x + 3*a^2 + 2*(b^2*x^2 + 2*a*b*x + a^2)*log(b*x + a))*log
(d*x + c)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) - 2*integrate(1/2*(2*
b^3*d*x^3 + 7*a^2*b*d*x + 3*a^3*d + 2*(b^3*c + 2*a*b^2*d)*x^2 + 2*(2*b^3*d*
x^3 + 3*a^2*b*d*x + a^3*d + (b^3*c + 3*a*b^2*d)*x^2)*log(b*x + a))/(b^6*d*g
^3*x^4 + a^3*b^3*c*g^3 + (b^6*c*g^3 + 3*a*b^5*d*g^3)*x^3 + 3*(a*b^5*c*g^3 +
 a^2*b^4*d*g^3)*x^2 + (3*a^2*b^4*c*g^3 + a^3*b^3*d*g^3)*x), x)) + 1/2*B*c*d
*(2*(2*b*x + a)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^4*g^3*x^2 + 2*a*b^3
*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c -
 a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)
*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*
d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*
b^2*d^2)*g^3)) - 1/2*A*d^2*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x
+ a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) - 1/4*B*c^2*((2*b*d*x - b*c + 3*
a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*
c - a^3*b*d)*g^3) - 2*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2 + 2
*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^
2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3
)) + (2*b*x + a)*A*c*d/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + 1/2*A*
c^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{(a\,g+b\,g\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.17 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=89

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

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

Rubi [A]
time = 0.07, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.050$, Rules used = {2562, 2341}

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

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^4,
x]
```

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

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(17c+17dx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx = \int \left(\frac{289(bc-ad)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^4(a+bx)^4} + \frac{578d(bc-ad)\,(}{b^2g^4}\right.$$

$$= \frac{(289d^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{b^2g^4} + \frac{(578d(bc-ad))\int \frac{A+B\log\left(\frac{e(a+}{c+d}\right.}{(a+bx)^3}}{b^2g^4}$$

$$= -\frac{289(bc-ad)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^3g^4(a+bx)^3} - \frac{289d(bc-ad)\left(A\right.}{b^3g^4(a}$$

$$= -\frac{289(bc-ad)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^3g^4(a+bx)^3} - \frac{289d(bc-ad)\left(A\right.}{b^3g^4(a}$$

$$= -\frac{289(bc-ad)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^3g^4(a+bx)^3} - \frac{289d(bc-ad)\left(A\right.}{b^3g^4(a}$$

$$= -\frac{289B(bc-ad)^2}{9b^3g^4(a+bx)^3} - \frac{289Bd(bc-ad)}{3b^3g^4(a+bx)^2} - \frac{289Bd^2}{3b^3g^4(a+bx)} - \frac{289}{3}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 315 vs. 2(89) = 178.
time = 0.21, size = 315, normalized size = 3.54

$$-\frac{i^2\left(3Ab^3c^3+b^3Bc^3-3a^3Ad^3-a^3Bd^3+9Ab^3c^2dx+3b^3Bc^2dx-9a^2Abd^3x-3a^2bBd^3x+9Ab^3cd^2x^2+3b^3Bcd^2x^2-9aAb^2d^3x^2-3ab^2Bd^3x^2+3Bd^3(a+bx)^3\log(a+bx)+3B(bc-ad)\left(a^2d^2+abd(c+3dx)+b^2(c^2+3cdx+3d^2x^2)\right)\log\left(\frac{e(a+bx)}{c+dx}\right)-3a^3Bd^3\log(c+dx)-9a^2bBd^3x\log(c+dx)-9ab^2Bd^3x^2\log(c+dx)-3b^3Bd^3x^3\log(c+dx)\right)}{9b^3(bc-ad)g^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^4,x]
```

```
[Out] -1/9*(i^2*(3*A*b^3*c^3 + b^3*B*c^3 - 3*a^3*A*d^3 - a^3*B*d^3 + 9*A*b^3*c^2*
d*x + 3*b^3*B*c^2*d*x - 9*a^2*A*b*d^3*x - 3*a^2*b*B*d^3*x + 9*A*b^3*c*d^2*x
^2 + 3*b^3*B*c*d^2*x^2 - 9*a*A*b^2*d^3*x^2 - 3*a*b^2*B*d^3*x^2 + 3*B*d^3*(a
 + b*x)^3*Log[a + b*x] + 3*B*(b*c - a*d)*(a^2*d^2 + a*b*d*(c + 3*d*x) + b^2
*(c^2 + 3*c*d*x + 3*d^2*x^2))*Log[(e*(a + b*x))/(c + d*x)] - 3*a^3*B*d^3*Lo
g[c + d*x] - 9*a^2*b*B*d^3*x*Log[c + d*x] - 9*a*b^2*B*d^3*x^2*Log[c + d*x]
- 3*b^3*B*d^3*x^3*Log[c + d*x]))/(b^3*(b*c - a*d)*g^4*(a + b*x)^3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 184 vs. 2(85) = 170.
time = 0.62, size = 185, normalized size = 2.08

method	result

derivativedivides	$-\frac{e(ad-cb)\left(-\frac{i^2 d^2 e^2 A}{3(ad-cb)^2 g^4 \left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}+\frac{i^2 d^2 e^2 B\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{3\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}-\frac{1}{9\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}\right)}{(ad-cb)^2 g^4}\right)}{d^2}$
default	$-\frac{e(ad-cb)\left(-\frac{i^2 d^2 e^2 A}{3(ad-cb)^2 g^4 \left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}+\frac{i^2 d^2 e^2 B\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{3\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}-\frac{1}{9\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}\right)}{(ad-cb)^2 g^4}\right)}{d^2}$
norman	$\frac{\frac{Bc\,d^2 i^2 x^2 \ln\left(\frac{e(bx+a)}{dx+c}\right)}{g(ad-cb)}+\frac{B\,c^2 d\,i^2 x \ln\left(\frac{e(bx+a)}{dx+c}\right)}{g(ad-cb)}-\frac{3Aacd\,i^2+3Ab\,c^2 i^2+Bacd\,i^2+Bb\,c^2 i^2}{9g\,b^2}+\frac{\left(3i^2 A\,d^2+B\,d^2 i^2\right)x^3}{9ag}-\frac{\left(3Acd\,i^2+Bcd\right.}{3gb}}{g^3(bx+a)^3}$
risch	$-\frac{B\,i^2\left(3d^2x^2b^2+3ab\,d^2x+3b^2cdx+a^2d^2+abcd+b^2c^2\right)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{3(bx+a)^3 g^4 b^3}-\frac{i^2\left(3B\ln(dx+c)b^3d^3x^3-3B\ln(-bx-a)b^3d^3x^3+9\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x,method=_RETUR
NVERBOSE)
```

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1503 vs. $2(80) = 160$.
time = 0.36, size = 1503, normalized size = 16.89

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="maxima")
```

```
[Out] 1/18*B*d^2*(6*(3*b^2*x^2 + 3*a*b*x + a^2)*log(b*x*e/(d*x + c) + a*e/(d*x +
c))/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + (11*a
^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2
*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^2)*x)/((b^8*c^2 - 2*
a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d
^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x + (a^3*b^
5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*c^2*d - 3*a*b*c*d^2 +
a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3
*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(d*x + c)/((b^6*c^3
```

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

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 247 vs. $2(80) = 160$.
time = 0.38, size = 247, normalized size = 2.78

$$\frac{(3A+B)b^3c^3 - (3A+B)a^3d^3 + 3\left((3A+B)b^3cd^2 - (3A+B)ab^2d^3\right)x^2 + 3\left((3A+B)b^3c^2d - (3A+B)a^2bd^3\right)x + 3\left(Bb^3d^3x^3 + 3Bb^3cd^2x^2 + 3Bb^3c^2dx + Bb^3c^3\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{9\left((b^7c - ab^6d)g^4x^3 + 3(ab^6c - a^2b^5d)g^4x^2 + 3(a^2b^5c - a^3b^4d)g^4x + (a^3b^4c - a^4b^3d)g^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="fricas")
```

```
[Out] 1/9*((3*A + B)*b^3*c^3 - (3*A + B)*a^3*d^3 + 3*((3*A + B)*b^3*c*d^2 - (3*A
+ B)*a*b^2*d^3)*x^2 + 3*((3*A + B)*b^3*c^2*d - (3*A + B)*a^2*b*d^3)*x + 3*(
B*b^3*d^3*x^3 + 3*B*b^3*c*d^2*x^2 + 3*B*b^3*c^2*d*x + B*b^3*c^3)*log((b*x +
 a)*e/(d*x + c)))/((b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*b^6*c - a^2*b^5*d)*g^4*
x^2 + 3*(a^2*b^5*c - a^3*b^4*d)*g^4*x + (a^3*b^4*c - a^4*b^3*d)*g^4)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 614 vs. $2(76) = 152$.
time = 12.80, size = 614, normalized size = 6.90

$$-\frac{Bd^3i^2\log\left(x + \frac{-\frac{Ba^2d^5i^2}{ad-bc} + \frac{2Babcd^4i^2}{ad-bc} + Bad^4i^2 - \frac{Bb^2c^2d^3i^2}{ad-bc} + Bbcd^3i^2}{2Bbd^4i^2}\right)}{3b^3g^4(ad-bc)} + \frac{Bd^3i^2\log\left(x + \frac{\frac{Ba^2d^5i^2}{ad-bc} - \frac{2Babcd^4i^2}{ad-bc} + Bad^4i^2 + \frac{Bb^2c^2d^3i^2}{ad-bc} + Bbcd^3i^2}{2Bbd^4i^2}\right)}{3b^3g^4(ad-bc)} + \frac{-3Aa^2d^2i^2 - 3Aabcdi^2 - 3Ab^2c^2i^2 - Ba^2d^2i^2 - Babcdi^2 - Bb^2c^2i^2 + x^2(-9Ab^2d^2i^2 - 3Bb^2d^2i^2) + x(-9Aabd^2i^2 - 9Ab^2cdi^2 - 3Babd^2i^2 - 3Bb^2cdi^2)}{9a^3b^3g^4 + 27a^2b^4g^4x + 27ab^5g^4x^2 + 9b^6g^4x^3} + \frac{(-Ba^2d^2i^2 - Babcdi^2 - 3Babd^2i^2x - Bb^2c^2i^2 - 3Bb^2cdi^2x - 3Bb^2d^2i^2x^2)\log\left(\frac{e(a+bx)}{c+dx}\right)}{3a^3b^3g^4 + 9a^2b^4g^4x + 9ab^5g^4x^2 + 3b^6g^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*d**3*i**2*log(x + (-B*a**2*d**5*i**2/(a*d - b*c) + 2*B*a*b*c*d**4*i**2/(
a*d - b*c) + B*a*d**4*i**2 - B*b**2*c**2*d**3*i**2/(a*d - b*c) + B*b*c*d**3
*i**2)/(2*B*b*d**4*i**2))/(3*b**3*g**4*(a*d - b*c)) + B*d**3*i**2*log(x + (
B*a**2*d**5*i**2/(a*d - b*c) - 2*B*a*b*c*d**4*i**2/(a*d - b*c) + B*a*d**4*i
**2 + B*b**2*c**2*d**3*i**2/(a*d - b*c) + B*b*c*d**3*i**2)/(2*B*b*d**4*i**2
))/(3*b**3*g**4*(a*d - b*c)) + (-3*A*a**2*d**2*i**2 - 3*A*a*b*c*d*i**2 - 3*
A*b**2*c**2*i**2 - B*a**2*d**2*i**2 - B*a*b*c*d*i**2 - B*b**2*c**2*i**2 + x
**2*(-9*A*b**2*d**2*i**2 - 3*B*b**2*d**2*i**2) + x*(-9*A*a*b*d**2*i**2 - 9*
A*b**2*c*d*i**2 - 3*B*a*b*d**2*i**2 - 3*B*b**2*c*d*i**2))/(9*a**3*b**3*g**4
 + 27*a**2*b**4*g**4*x + 27*a*b**5*g**4*x**2 + 9*b**6*g**4*x**3) + (-B*a**2
*d**2*i**2 - B*a*b*c*d*i**2 - 3*B*a*b*d**2*i**2*x - B*b**2*c**2*i**2 - 3*B*
b**2*c*d*i**2*x - 3*B*b**2*d**2*i**2*x**2)*log(e*(a + b*x)/(c + d*x))/(3*a*
*3*b**3*g**4 + 9*a**2*b**4*g**4*x + 9*a*b**5*g**4*x**2 + 3*b**6*g**4*x**3)
```

Giac [A]
time = 3.22, size = 114, normalized size = 1.28

$$\frac{\left(3\,Be^4\log\left(\frac{bxe+ae}{dx+c}\right)+3\,Ae^4+Be^4\right)(dx+c)^3\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{9\,(bxe+ae)^3g^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="giac")
```

```
[Out] 1/9*(3*B*e^4*log((b*x*e + a*e)/(d*x + c)) + 3*A*e^4 + B*e^4)*(d*x + c)^3*(b
*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x
*e + a*e)^3*g^4)
```

Mupad [B]
time = 6.19, size = 423, normalized size = 4.75

$$-\frac{x^2\,(3\,A\,b^2\,d^2\,i^2+B\,b^2\,d^2\,i^2)+x\,(3\,A\,a\,b\,d^2\,i^2+B\,a\,b\,d^2\,i^2+3\,A\,b^2\,c\,d\,i^2+B\,b^2\,c\,d\,i^2)+A\,a^2\,d^2\,i^2+A\,b^2\,c^2\,i^2+\frac{B\,a^2\,d^2\,i^2}{3}+\frac{B\,b^2\,c^2\,i^2}{3}+A\,a\,b\,c\,d\,i^2+\frac{B\,a\,b\,c\,d\,i^2}{3}}{3\,a^3\,b^3\,g^4+9\,a^2\,b^4\,g^4\,x+9\,a\,b^5\,g^4\,x^2+3\,b^6\,g^4\,x^3}-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\,\left(a\,\left(\frac{B\,a\,d^2\,i^2}{3\,b^4\,g^4}+\frac{B\,c\,d\,i^2}{3\,b^3\,g^4}\right)+x\,\left(b\,\left(\frac{B\,a\,d^2\,i^2}{3\,b^4\,g^4}+\frac{B\,c\,d\,i^2}{3\,b^3\,g^4}\right)+\frac{2\,B\,a\,d^2\,i^2}{3\,b^3\,g^4}+\frac{2\,B\,c\,d\,i^2}{3\,b^2\,g^4}\right)+\frac{B\,c^2\,i^2}{3\,b^2\,g^4}+\frac{B\,d^2\,i^2\,x^2}{b^2\,g^4}\right)}{3\,a^2\,x+\frac{a^3}{b}+b^2\,x^3+3\,a\,b\,x^2}-\frac{B\,d^3\,i^2\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,2\mathrm{i}}{3\,b^3\,g^4\,(a\,d-b\,c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x))))/(a*g + b*g*x)^4,
x)
```

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

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

3.18 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=181

$$\frac{Bdi^2(c+dx)^3}{9(bc-ad)^2g^5(a+bx)^3}-\frac{bBi^2(c+dx)^4}{16(bc-ad)^2g^5(a+bx)^4}+\frac{di^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3(bc-ad)^2g^5(a+bx)^3}-\frac{bi^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4(bc-ad)^2g^5(a+bx)^4}$$

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

Rubi [A]
time = 0.11, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 45, 2372, 12}

$$-\frac{bi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^2}+\frac{di^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^2}-\frac{bBi^2(c+dx)^4}{16g^5(a+bx)^4(bc-ad)^2}+\frac{Bdi^2(c+dx)^3}{9g^5(a+bx)^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^5,
x]
```

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

Rule 12

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

Rule 45

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

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
```

```
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(18c+18dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx = \int \left(\frac{324(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^5(a+bx)^5} + \frac{648d(bc-ad)\,(\ldots}{b^2g^5\ldots}\right.$$

$$= \frac{(324d^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{b^2g^5} + \frac{(648d(bc-ad))\int \frac{A+B\log\left(\frac{e(a+\ldots}{c+\ldots}\right)}{(a+bx)^4}\ldots}{b^2g^5}$$

$$= -\frac{81(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{216d(bc-ad)\left(A+\ldots\right.}{b^3g^5(a+\ldots}$$

$$= -\frac{81(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{216d(bc-ad)\left(A+\ldots\right.}{b^3g^5(a+\ldots}$$

$$= -\frac{81(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{216d(bc-ad)\left(A+\ldots\right.}{b^3g^5(a+\ldots}$$

$$= -\frac{81B(bc-ad)^2}{4b^3g^5(a+bx)^4} - \frac{45Bd(bc-ad)}{b^3g^5(a+bx)^3} - \frac{27Bd^2}{2b^3g^5(a+bx)^2} + \frac{\ldots}{b^3(bc\ldots}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 454 vs. 2(181) = 362.
time = 0.25, size = 454, normalized size = 2.51

$$-\frac{i^2\left(36Ab^4c^4+9b^4Bc^4-48aAb^3c^3d-16ab^3Bc^3d+12a^4Ad^4+7a^4Bd^4+96Ab^4c^3dx+20b^4Bc^3dx-144aAb^3c^2d^2x-48ab^3Bc^2d^2x+48a^3Abd^4x+28a^3bBd^4x+72Ab^4c^2d^2x^2+6b^4Bc^2d^2x^2-144aAb^3cd^3x^2-48ab^3Bcd^3x^2+72a^2Ab^2d^4x^2+42a^2b^2Bd^4x^2-12b^4Bcd^3x^3+12ab^3Bd^4x^3-12Bd^4(a+bx)^4\log(a+bx)+12B(bc-ad)^2\left(a^2d^2+2abd(c+2dx)+b^2(3c^2+8cdx+6d^2x^2)\right)\log\left(\frac{e(a+bx)}{c+dx}\right)+12a^4Bd^4\log(c+dx)+48a^3bBd^4x\log(c+dx)+72a^2b^2Bd^4x^2\log(c+dx)+48ab^3Bd^4x^3\log(c+dx)+12b^4Bd^4x^4\log(c+dx)\right)}{144b^3(bc-ad)^2g^5(a+bx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^5,x]
```

```
[Out] -1/144*(i^2*(36*A*b^4*c^4 + 9*b^4*B*c^4 - 48*a*A*b^3*c^3*d - 16*a*b^3*B*c^3
*d + 12*a^4*A*d^4 + 7*a^4*B*d^4 + 96*A*b^4*c^3*d*x + 20*b^4*B*c^3*d*x - 144
*a*A*b^3*c^2*d^2*x - 48*a*b^3*B*c^2*d^2*x + 48*a^3*A*b*d^4*x + 28*a^3*b*B*d
^4*x + 72*A*b^4*c^2*d^2*x^2 + 6*b^4*B*c^2*d^2*x^2 - 144*a*A*b^3*c*d^3*x^2 -
 48*a*b^3*B*c*d^3*x^2 + 72*a^2*A*b^2*d^4*x^2 + 42*a^2*b^2*B*d^4*x^2 - 12*b^
4*B*c*d^3*x^3 + 12*a*b^3*B*d^4*x^3 - 12*B*d^4*(a + b*x)^4*Log[a + b*x] + 12
*B*(b*c - a*d)^2*(a^2*d^2 + 2*a*b*d*(c + 2*d*x) + b^2*(3*c^2 + 8*c*d*x + 6*
d^2*x^2))*Log[(e*(a + b*x))/(c + d*x)] + 12*a^4*B*d^4*Log[c + d*x] + 48*a^3
*b*B*d^4*x*Log[c + d*x] + 72*a^2*b^2*B*d^4*x^2*Log[c + d*x] + 48*a*b^3*B*d^
4*x^3*Log[c + d*x] + 12*b^4*B*d^4*x^4*Log[c + d*x]))/(b^3*(b*c - a*d)^2*g^5
*(a + b*x)^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 356 vs. $2(173) = 346$.
time = 0.69, size = 357, normalized size = 1.97 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x,method=_RETUR
NVERBOSE)
```

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 2206 vs. $2(163) = 326$.
time = 0.41, size = 2206, normalized size = 12.19

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="maxima")
```

```
[Out] 1/144*B*d^2*(12*(6*b^2*x^2 + 4*a*b*x + a^2)*log(b*x*e/(d*x + c) + a*e/(d*x
+ c))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x
+ a^4*b^3*g^5) + (13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^
5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 -
 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 -
 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9
*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*
```

```
c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7
*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^
6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c
^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^
3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4
*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*
d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4
*c*d^3 + a^4*b^3*d^4)*g^5)) + 1/72*B*c*d*(12*(4*b*x + a)*log(b*x*e/(d*x + c
) + a*e/(d*x + c))/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a
^3*b^3*g^5*x + a^4*b^2*g^5) + (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*
d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a
*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^
2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^
3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4
*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^
5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a
^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*
b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3
*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^
3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a
^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) - 1/48*B*c^2*((12*b^3*d^3*x^3 - 3*b^3*c^3
 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^
3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^
7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6
*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^
5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b
^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*
c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) - 12*log(b*x*e/(d*x + c) + a*e/(d
*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5
*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3
*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^
4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))
+ 1/6*(4*b*x + a)*A*c*d/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2
+ 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + 1/12*(6*b^2*x^2 + 4*a*b*x + a^2)*A*d^2/(
b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b
^3*g^5) + 1/4*A*c^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*
a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 476 vs. $2(163) = 326$.

time = 0.39, size = 476, normalized size = 2.63

$$\frac{9\,(4\,A+B)b^4c^4-16\,(3\,A+B)ab^3c^3d+(12\,A+7\,B)a^4d^4-12\,(Bb^4cd^3-Bab^3d^4)x^3+6\,((12\,A+B)b^4c^2d^2-8\,(3\,A+B)ab^3cd^3+(12\,A+7\,B)a^2b^2d^4)x^2+4\,((24\,A+5\,B)b^4c^3d-12\,(3\,A+B)ab^3c^2d^2+(12\,A+7\,B)a^3bd^4)x-12\,(Bb^4d^4x^4+4\,Bab^3d^4x^3-3\,Bb^4c^4+4\,Bab^3c^3d-6\,(Bb^4c^2d^2-2\,Bab^3cd^3)x^2-4\,(2\,Bb^4c^3d-3\,Bab^3c^2d^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{144\,((b^9c^2-2\,ab^8cd+a^2b^7d^2)g^5x^4+4\,(ab^8c^2-2\,a^2b^7cd+a^3b^6d^2)g^5x^3+6\,(a^2b^7c^2-2\,a^3b^6cd+a^4b^5d^2)g^5x^2+4\,(a^3b^6c^2-2\,a^4b^5cd+a^5b^4d^2)g^5x+(a^4b^5c^2-2\,a^5b^4cd+a^6b^3d^2)g^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="fricas")
```

```
[Out] 1/144*(9*(4*A + B)*b^4*c^4 - 16*(3*A + B)*a*b^3*c^3*d + (12*A + 7*B)*a^4*d^
4 - 12*(B*b^4*c*d^3 - B*a*b^3*d^4)*x^3 + 6*((12*A + B)*b^4*c^2*d^2 - 8*(3*A
 + B)*a*b^3*c*d^3 + (12*A + 7*B)*a^2*b^2*d^4)*x^2 + 4*((24*A + 5*B)*b^4*c^3
*d - 12*(3*A + B)*a*b^3*c^2*d^2 + (12*A + 7*B)*a^3*b*d^4)*x - 12*(B*b^4*d^4
*x^4 + 4*B*a*b^3*d^4*x^3 - 3*B*b^4*c^4 + 4*B*a*b^3*c^3*d - 6*(B*b^4*c^2*d^2
 - 2*B*a*b^3*c*d^3)*x^2 - 4*(2*B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2)*x)*log((b*x
 + a)*e/(d*x + c)))/((b^9*c^2 - 2*a*b^8*c*d + a^2*b^7*d^2)*g^5*x^4 + 4*(a*b
^8*c^2 - 2*a^2*b^7*c*d + a^3*b^6*d^2)*g^5*x^3 + 6*(a^2*b^7*c^2 - 2*a^3*b^6*
c*d + a^4*b^5*d^2)*g^5*x^2 + 4*(a^3*b^6*c^2 - 2*a^4*b^5*c*d + a^5*b^4*d^2)*
g^5*x + (a^4*b^5*c^2 - 2*a^5*b^4*c*d + a^6*b^3*d^2)*g^5)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 928 vs. $2(165) = 330$.
time = 29.52, size = 928, normalized size = 5.13

$$- \frac{B d^{4} i^{2} \log{\left(x + \frac{- \frac{B a^{3} d^{7} i^{2}}{\left(a d - b c\right)^{2}} + \frac{3 B a^{2} b c d^{6} i^{2}}{\left(a d - b c\right)^{2}} - \frac{3 B a b^{2} c^{2} d^{5} i^{2}}{\left(a d - b c\right)^{2}} + B a d^{5} i^{2} + \frac{B b^{3} c^{3} d^{4} i^{2}}{\left(a d - b c\right)^{2}} + B b c d^{4} i^{2}}{2 B b d^{5} i^{2}} \right)}}{12 b^{3} g^{5} \left(a d - b c\right)^{2}} + \frac{B d^{4} i^{2} \log{\left(x + \frac{\frac{B a^{3} d^{7} i^{2}}{\left(a d - b c\right)^{2}} - \frac{3 B a^{2} b c d^{6} i^{2}}{\left(a d - b c\right)^{2}} + \frac{3 B a b^{2} c^{2} d^{5} i^{2}}{\left(a d - b c\right)^{2}} + B a d^{5} i^{2} - \frac{B b^{3} c^{3} d^{4} i^{2}}{\left(a d - b c\right)^{2}} + B b c d^{4} i^{2}}{2 B b d^{5} i^{2}} \right)}}{12 b^{3} g^{5} \left(a d - b c\right)^{2}} + \frac{- 12 A a^{3} d^{3} i^{2} - 12 A a^{2} b c d^{2} i^{2} - 12 A a b^{2} c^{2} d i^{2} + 36 A b^{3} c^{3} i^{2} - 7 B a^{3} d^{3} i^{2} - 7 B a^{2} b c d^{2} i^{2} - 7 B a b^{2} c^{2} d i^{2} + 9 B b^{3} c^{3} i^{2} - 12 B b^{3} d^{3} i^{2} x^{3} + x^{2} \left(- 72 A a b^{2} d^{3} i^{2} + 72 A b^{3} c d^{2} i^{2} - 42 B a b^{2} d^{3} i^{2} + 6 B b^{3} c d^{2} i^{2}\right) + x \left(- 48 A a^{2} b d^{3} i^{2} - 48 A a b^{2} c d^{2} i^{2} + 96 A b^{3} c^{2} d i^{2} - 28 B a^{2} b d^{3} i^{2} - 28 B a b^{2} c d^{2} i^{2} + 20 B b^{3} c^{2} d i^{2}\right)}{144 a^{5} b^{3} d g^{5} - 144 a^{4} b^{4} c g^{5} + x^{4} \cdot \left(144 a b^{7} d g^{5} - 144 b^{8} c g^{5}\right) + x^{3} \cdot \left(576 a^{2} b^{6} d g^{5} - 576 a b^{7} c g^{5}\right) + x^{2} \cdot \left(864 a^{3} b^{5} d g^{5} - 864 a^{2} b^{6} c g^{5}\right) + x \left(576 a^{4} b^{4} d g^{5} - 576 a^{3} b^{5} c g^{5}\right)} + \frac{\left(- B a^{2} d^{2} i^{2} - 2 B a b c d i^{2} - 4 B a b d^{2} i^{2} x - 3 B b^{2} c^{2} i^{2} - 8 B b^{2} c d i^{2} x - 6 B b^{2} d^{2} i^{2} x^{2}\right) \log{\left(\frac{e \left(a + b x\right)}{c + d x} \right)}}{12 a^{4} b^{3} g^{5} + 48 a^{3} b^{4} g^{5} x + 72 a^{2} b^{5} g^{5} x^{2} + 48 a b^{6} g^{5} x^{3} + 12 b^{7} g^{5} x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*d**4*i**2*log(x + (-B*a**3*d**7*i**2/(a*d - b*c)**2 + 3*B*a**2*b*c*d**6*
i**2/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**5*i**2/(a*d - b*c)**2 + B*a*d**5*i
**2 + B*b**3*c**3*d**4*i**2/(a*d - b*c)**2 + B*b*c*d**4*i**2)/(2*B*b*d**5*i
**2))/(12*b**3*g**5*(a*d - b*c)**2) + B*d**4*i**2*log(x + (B*a**3*d**7*i**2
/(a*d - b*c)**2 - 3*B*a**2*b*c*d**6*i**2/(a*d - b*c)**2 + 3*B*a*b**2*c**2*d
**5*i**2/(a*d - b*c)**2 + B*a*d**5*i**2 - B*b**3*c**3*d**4*i**2/(a*d - b*c)
**2 + B*b*c*d**4*i**2)/(2*B*b*d**5*i**2))/(12*b**3*g**5*(a*d - b*c)**2) + (
-12*A*a**3*d**3*i**2 - 12*A*a**2*b*c*d**2*i**2 - 12*A*a*b**2*c**2*d*i**2 +
36*A*b**3*c**3*i**2 - 7*B*a**3*d**3*i**2 - 7*B*a**2*b*c*d**2*i**2 - 7*B*a*b
**2*c**2*d*i**2 + 9*B*b**3*c**3*i**2 - 12*B*b**3*d**3*i**2*x**3 + x**2*(-72
*A*a*b**2*d**3*i**2 + 72*A*b**3*c*d**2*i**2 - 42*B*a*b**2*d**3*i**2 + 6*B*b
**3*c*d**2*i**2) + x*(-48*A*a**2*b*d**3*i**2 - 48*A*a*b**2*c*d**2*i**2 + 96
*A*b**3*c**2*d*i**2 - 28*B*a**2*b*d**3*i**2 - 28*B*a*b**2*c*d**2*i**2 + 20*
B*b**3*c**2*d*i**2))/(144*a**5*b**3*d*g**5 - 144*a**4*b**4*c*g**5 + x**4*(1
44*a*b**7*d*g**5 - 144*b**8*c*g**5) + x**3*(576*a**2*b**6*d*g**5 - 576*a*b*
*7*c*g**5) + x**2*(864*a**3*b**5*d*g**5 - 864*a**2*b**6*c*g**5) + x*(576*a*
*4*b**4*d*g**5 - 576*a**3*b**5*c*g**5)) + (-B*a**2*d**2*i**2 - 2*B*a*b*c*d*
i**2 - 4*B*a*b*d**2*i**2*x - 3*B*b**2*c**2*i**2 - 8*B*b**2*c*d*i**2*x - 6*B
*b**2*d**2*i**2*x**2)*log(e*(a + b*x)/(c + d*x))/(12*a**4*b**3*g**5 + 48*a*
*3*b**4*g**5*x + 72*a**2*b**5*g**5*x**2 + 48*a*b**6*g**5*x**3 + 12*b**7*g**
5*x**4)
```

Giac [**A**]

time = 3.22, size = 238, normalized size = 1.31

$$\frac{\left(36\,Bbe^5\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{48\,(bxe+ae)Bde^4\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+36\,Abe^5+9\,Bbe^5-\frac{48\,(bxe+ae)Ade^4}{dx+c}-\frac{16\,(bxe+ae)Bde^4}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{144\left(\frac{(bxe+ae)^4bcg^5}{(dx+c)^4}-\frac{(bxe+ae)^4adg^5}{(dx+c)^4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="giac")
```

```
[Out] 1/144*(36*B*b*e^5*log((b*x*e + a*e)/(d*x + c)) - 48*(b*x*e + a*e)*B*d*e^4*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c) + 36*A*b*e^5 + 9*B*b*e^5 - 48*(b*x*e
+ a*e)*A*d*e^4/(d*x + c) - 16*(b*x*e + a*e)*B*d*e^4/(d*x + c))*(b*c/((b*c*e
 - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^
4*b*c*g^5/(d*x + c)^4 - (b*x*e + a*e)^4*a*d*g^5/(d*x + c)^4)
```

Mupad [B]

time = 6.86, size = 647, normalized size = 3.57

$$-\frac{\frac{12\,A\,a^3\,d^3\,i^2-36\,A\,b^3\,c^3\,i^2+7\,B\,a^3\,d^3\,i^2-9\,B\,b^3\,c^3\,i^2+12\,A\,a\,b^2\,c^2\,d\,i^2+12\,A\,a^2\,b\,c\,d^2\,i^2+7\,B\,a\,b^2\,c^2\,d\,i^2+7\,B\,a^2\,b\,c\,d^2\,i^2}{12\,(a\,d-b\,c)}+\frac{x^2\,\left(12\,A\,a\,b^2\,d^3\,i^2+7\,B\,a\,b^2\,d^3\,i^2-12\,A\,b^3\,c\,d^2\,i^2-B\,b^3\,c\,d^2\,i^2\right)}{2\,(a\,d-b\,c)}+\frac{x\,\left(12\,A\,a^2\,b\,d^3\,i^2+7\,B\,a^2\,b\,d^3\,i^2-24\,A\,b^3\,c^2\,d\,i^2-5\,B\,b^3\,c^2\,d\,i^2+12\,A\,a\,b^2\,c\,d^2\,i^2+7\,B\,a\,b^2\,c\,d^2\,i^2\right)}{3\,(a\,d-b\,c)}+\frac{B\,b^3\,d^3\,i^2\,x^3}{a\,d-b\,c}}{12\,a^4\,b^3\,g^5+48\,a^3\,b^4\,g^5\,x+72\,a^2\,b^5\,g^5\,x^2+48\,a\,b^6\,g^5\,x^3+12\,b^7\,g^5\,x^4}-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\,\left(a\,\left(\frac{B\,a\,d^2\,i^2}{12\,b^4\,g^5}+\frac{B\,c\,d\,i^2}{6\,b^3\,g^5}\right)+x\,\left(b\,\left(\frac{B\,a\,d^2\,i^2}{12\,b^4\,g^5}+\frac{B\,c\,d\,i^2}{6\,b^3\,g^5}\right)+\frac{B\,a\,d^2\,i^2}{4\,b^3\,g^5}+\frac{B\,c\,d\,i^2}{2\,b^2\,g^5}\right)+\frac{B\,c^2\,i^2}{4\,b^2\,g^5}+\frac{B\,d^2\,i^2\,x^2}{2\,b^2\,g^5}\right)}{4\,a^3\,x+\frac{a^4}{b}+b^3\,x^4+6\,a^2\,b\,x^2+4\,a\,b^2\,x^3}-\frac{B\,d^4\,i^2\,\mathrm{atanh}\left(\frac{12\,b^5\,c^2\,g^5-12\,a^2\,b^3\,d^2\,g^5}{12\,b^3\,g^5\,{(a\,d-b\,c)}^2}-\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{6\,b^3\,g^5\,{(a\,d-b\,c)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x))))/(a*g + b*g*x)^5,
x)
```

```
[Out] - ((12*A*a^3*d^3*i^2 - 36*A*b^3*c^3*i^2 + 7*B*a^3*d^3*i^2 - 9*B*b^3*c^3*i^2
 + 12*A*a*b^2*c^2*d*i^2 + 12*A*a^2*b*c*d^2*i^2 + 7*B*a*b^2*c^2*d*i^2 + 7*B*
a^2*b*c*d^2*i^2)/(12*(a*d - b*c)) + (x^2*(12*A*a*b^2*d^3*i^2 + 7*B*a*b^2*d^
3*i^2 - 12*A*b^3*c*d^2*i^2 - B*b^3*c*d^2*i^2))/(2*(a*d - b*c)) + (x*(12*A*a
^2*b*d^3*i^2 + 7*B*a^2*b*d^3*i^2 - 24*A*b^3*c^2*d*i^2 - 5*B*b^3*c^2*d*i^2 +
 12*A*a*b^2*c*d^2*i^2 + 7*B*a*b^2*c*d^2*i^2))/(3*(a*d - b*c)) + (B*b^3*d^3*
i^2*x^3)/(a*d - b*c))/(12*a^4*b^3*g^5 + 12*b^7*g^5*x^4 + 48*a^3*b^4*g^5*x +
 48*a*b^6*g^5*x^3 + 72*a^2*b^5*g^5*x^2) - (log((e*(a + b*x))/(c + d*x))*(a*
((B*a*d^2*i^2)/(12*b^4*g^5) + (B*c*d*i^2)/(6*b^3*g^5)) + x*(b*((B*a*d^2*i^2
)/(12*b^4*g^5) + (B*c*d*i^2)/(6*b^3*g^5)) + (B*a*d^2*i^2)/(4*b^3*g^5) + (B*
c*d*i^2)/(2*b^2*g^5)) + (B*c^2*i^2)/(4*b^2*g^5) + (B*d^2*i^2*x^2)/(2*b^2*g^
5)))/(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 + 4*a*b^2*x^3) - (B*d^4*i^2*a
tanh((12*b^5*c^2*g^5 - 12*a^2*b^3*d^2*g^5)/(12*b^3*g^5*(a*d - b*c)^2) - (2*
b*d*x)/(a*d - b*c)))/(6*b^3*g^5*(a*d - b*c)^2)
```

3.19 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=281

$$-\frac{Bd^2i^2(c+dx)^3}{9(bc-ad)^3g^6(a+bx)^3}+\frac{bBdi^2(c+dx)^4}{8(bc-ad)^3g^6(a+bx)^4}-\frac{b^2Bi^2(c+dx)^5}{25(bc-ad)^3g^6(a+bx)^5}-\frac{d^2i^2(c+dx)^3\left(A+B\log\left(\frac{e(a\text{-}}{c+}\right.\right.}{3(bc-ad)^3g^6(a+bx)^3}$$

```
[Out] -1/9*B*d^2*i^2*(d*x+c)^3/(-a*d+b*c)^3/g^6/(b*x+a)^3+1/8*b*B*d*i^2*(d*x+c)^4
/(-a*d+b*c)^3/g^6/(b*x+a)^4-1/25*b^2*B*i^2*(d*x+c)^5/(-a*d+b*c)^3/g^6/(b*x+
a)^5-1/3*d^2*i^2*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^6/(b*
x+a)^3+1/2*b*d*i^2*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^6/(
b*x+a)^4-1/5*b^2*i^2*(d*x+c)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^6
/(b*x+a)^5
```

Rubi [A]
time = 0.15, antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2562, 45, 2372, 12, 14}

$$-\frac{b^2i^2(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5g^6(a+bx)^5(bc-ad)^3}-\frac{d^2i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^6(a+bx)^3(bc-ad)^3}+\frac{bdi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^6(a+bx)^4(bc-ad)^3}-\frac{b^2Bi^2(c+dx)^5}{25g^6(a+bx)^5(bc-ad)^3}-\frac{Bd^2i^2(c+dx)^3}{9g^6(a+bx)^3(bc-ad)^3}+\frac{bBdi^2(c+dx)^4}{8g^6(a+bx)^4(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^6,
x]
```

```
[Out] -1/9*(B*d^2*i^2*(c + d*x)^3)/((b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B*d*i^2*(
c + d*x)^4)/(8*(b*c - a*d)^3*g^6*(a + b*x)^4) - (b^2*B*i^2*(c + d*x)^5)/(25
*(b*c - a*d)^3*g^6*(a + b*x)^5) - (d^2*i^2*(c + d*x)^3*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(3*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*d*i^2*(c + d*x)^4*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^6*(a + b*x)^4) - (
b^2*i^2*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*(b*c - a*d)^3*
g^6*(a + b*x)^5)
```

Rule 12

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

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

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

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(19c+19dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx = \int \left(\frac{361(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^6(a+bx)^6}+\frac{722d(bc-ad)\left(\right.}{b^2g^{6}}\right.$$

$$= \frac{(361d^2)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}\,dx}{b^2g^6}+\frac{(722d(bc-ad))\int\frac{A+B\log\left(\frac{e(a+}{c+}\right.}{(a+bx)^5}}{b^2g^6}$$

$$= -\frac{361(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^3g^6(a+bx)^5}-\frac{361d(bc-ad)\left(A\right.}{2b^3g^6(a}$$

$$= -\frac{361(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^3g^6(a+bx)^5}-\frac{361d(bc-ad)\left(A\right.}{2b^3g^6(a}$$

$$= -\frac{361(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^3g^6(a+bx)^5}-\frac{361d(bc-ad)\left(A\right.}{2b^3g^6(a}$$

$$= -\frac{361B(bc-ad)^2}{25b^3g^6(a+bx)^5}-\frac{1083Bd(bc-ad)}{40b^3g^6(a+bx)^4}-\frac{361Bd^2}{90b^3g^6(a+bx)^3}+$$

Mathematica [A]
time = 0.58, size = 344, normalized size = 1.22

$$\frac{i^2\left(-\frac{360Ab^2c^2}{(a+bx)^5}-\frac{72b^2Bc^2}{(a+bx)^5}+\frac{720aAbcd}{(a+bx)^5}+\frac{144abBcd}{(a+bx)^5}-\frac{360a^2Ad^2}{(a+bx)^5}-\frac{72a^2Bd^2}{(a+bx)^5}-\frac{900Abcd}{(a+bx)^4}-\frac{135bBcd}{(a+bx)^4}+\frac{900aAd^2}{(a+bx)^4}+\frac{135aBd^2}{(a+bx)^4}-\frac{600Ad^2}{(a+bx)^3}-\frac{20Bd^2}{(a+bx)^3}+\frac{30Bd^3}{(bc-ad)(a+bx)^2}-\frac{60Bd^4}{(bc-ad)^2(a+bx)}-\frac{60Bd^5\log(a+bx)}{(bc-ad)^3}-\frac{60B\left(a^2d^2+abd(3c+5dx)+b^2\left(6c^2+15cdx+10d^2x^2\right)\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^5}+\frac{60Bd^5\log(c+dx)}{(bc-ad)^3}\right)}{1800b^3g^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^6,x]
```

```
[Out] (i^2*((-360*A*b^2*c^2)/(a + b*x)^5 - (72*b^2*B*c^2)/(a + b*x)^5 + (720*a*A*
b*c*d)/(a + b*x)^5 + (144*a*b*B*c*d)/(a + b*x)^5 - (360*a^2*A*d^2)/(a + b*x
)^5 - (72*a^2*B*d^2)/(a + b*x)^5 - (900*A*b*c*d)/(a + b*x)^4 - (135*b*B*c*d
)/(a + b*x)^4 + (900*a*A*d^2)/(a + b*x)^4 + (135*a*B*d^2)/(a + b*x)^4 - (60
0*A*d^2)/(a + b*x)^3 - (20*B*d^2)/(a + b*x)^3 + (30*B*d^3)/((b*c - a*d)*(a
+ b*x)^2) - (60*B*d^4)/((b*c - a*d)^2*(a + b*x)) - (60*B*d^5*Log[a + b*x])/
(b*c - a*d)^3 - (60*B*(a^2*d^2 + a*b*d*(3*c + 5*d*x) + b^2*(6*c^2 + 15*c*d*
x + 10*d^2*x^2))*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^5 + (60*B*d^5*Log[
c + d*x])/(b*c - a*d)^3))/(1800*b^3*g^6)
```

Maple [A]
time = 0.79, size = 532, normalized size = 1.89 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/5*i^2*d^2*e^4/(a*d-b*c)^4/g^6*A*b^2/(b*e/d+(a*d-b*c)
*e/d/(d*x+c))^5+1/2*i^2*d^3*e^3/(a*d-b*c)^4/g^6*A*b/(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^4-1/3*i^2*d^4*e^2/(a*d-b*c)^4/g^6*A/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3+
i^2*d^2*e^4/(a*d-b*c)^4/g^6*B*b^2*(-1/5/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/25/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5)-2*i^2*d^
3*e^3/(a*d-b*c)^4/g^6*B*b*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))-1/16/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4)+i^2*d^4*e^2/(a*d
-b*c)^4/g^6*B*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-1/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 3017 vs. 2(254) = 508.
time = 0.56, size = 3017, normalized size = 10.74

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="maxima")
```

[Out] 1/1800*B*d^2*(60*(10*b^2*x^2 + 5*a*b*x + a^2)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + (47*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c^4 - 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6)) + 1/600*B*c*d*(60*(5*b*x + a)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) + (27*a*b^4*c^4 - 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) + 1/300*B*c^2*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*c^4 -

```
4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*d^4)*g^6*x^
3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*b^4*c*d^3
 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6*b^4*c^2*
d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*b^4*c^3*d
 + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*log(b*x*e/(d*
x + c) + a*e/(d*x + c))/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3
 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6) + 60*d^5*log(b*x + a)/
((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4
*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a*b^5*c^4*
d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*
g^6)) + 1/10*(5*b*x + a)*A*c*d/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*
g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) + 1/30*(10*b^
2*x^2 + 5*a*b*x + a^2)*A*d^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^
6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + 1/5*A*c^2/(b^
6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a
^4*b^2*g^6*x + a^5*b*g^6)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 769 vs. $2(254) = 508$.
time = 0.44, size = 769, normalized size = 2.74

$$\frac{72\,(5\,A+B)b^5c^5-225\,(4\,A+B)ab^4c^4d+200\,(3\,A+B)a^2b^3c^3d^2-(60\,A+47\,B)a^5d^5+60\,(Bb^5cd^4-Bab^4d^5)x^4-30\,(Bb^5c^2d^3-10\,Bab^4cd^4+9\,Ba^2b^3d^5)x^3+10\,(2\,(30\,A+B)b^5c^3d^2-15\,(12\,A+B)ab^4c^2d^3+60\,(3\,A+B)a^2b^3cd^4-(60\,A+47\,B)a^3b^2d^5)x^2+5\,(9\,(20\,A+3\,B)b^5c^4d-20\,(24\,A+5\,B)ab^4c^3d^2+120\,(3\,A+B)a^2b^3c^2d^3-(60\,A+47\,B)a^4bd^5)x+60\,(Bb^5d^5x^5+5\,Bab^4d^5x^4+10\,Ba^2b^3d^5x^3+6\,Bb^5c^5-15\,Bab^4c^4d+10\,Ba^2b^3c^3d^2+10\,(Bb^5c^3d^2-3\,Bab^4c^2d^3+3\,Ba^2b^3cd^4)x^2+5\,(3\,Bb^5c^4d-8\,Bab^4c^3d^2+6\,Ba^2b^3c^2d^3)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{1800\,((b^{11}c^3-3\,ab^{10}c^2d+3\,a^2b^9cd^2-a^3b^8d^3)g^6x^5+5\,(ab^{10}c^3-3\,a^2b^9c^2d+3\,a^3b^8cd^2-a^4b^7d^3)g^6x^4+10\,(a^2b^9c^3-3\,a^3b^8c^2d+3\,a^4b^7cd^2-a^5b^6d^3)g^6x^3+10\,(a^3b^8c^3-3\,a^4b^7c^2d+3\,a^5b^6cd^2-a^6b^5d^3)g^6x^2+5\,(a^4b^7c^3-3\,a^5b^6c^2d+3\,a^6b^5cd^2-a^7b^4d^3)g^6x+(a^5b^6c^3-3\,a^6b^5c^2d+3\,a^7b^4cd^2-a^8b^3d^3)g^6)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="fricas")
```

```
[Out] 1/1800*(72*(5*A + B)*b^5*c^5 - 225*(4*A + B)*a*b^4*c^4*d + 200*(3*A + B)*a^
2*b^3*c^3*d^2 - (60*A + 47*B)*a^5*d^5 + 60*(B*b^5*c*d^4 - B*a*b^4*d^5)*x^4
- 30*(B*b^5*c^2*d^3 - 10*B*a*b^4*c*d^4 + 9*B*a^2*b^3*d^5)*x^3 + 10*(2*(30*A
 + B)*b^5*c^3*d^2 - 15*(12*A + B)*a*b^4*c^2*d^3 + 60*(3*A + B)*a^2*b^3*c*d^
4 - (60*A + 47*B)*a^3*b^2*d^5)*x^2 + 5*(9*(20*A + 3*B)*b^5*c^4*d - 20*(24*A
 + 5*B)*a*b^4*c^3*d^2 + 120*(3*A + B)*a^2*b^3*c^2*d^3 - (60*A + 47*B)*a^4*b
*d^5)*x + 60*(B*b^5*d^5*x^5 + 5*B*a*b^4*d^5*x^4 + 10*B*a^2*b^3*d^5*x^3 + 6*
B*b^5*c^5 - 15*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 + 10*(B*b^5*c^3*d^2 - 3
*B*a*b^4*c^2*d^3 + 3*B*a^2*b^3*c*d^4)*x^2 + 5*(3*B*b^5*c^4*d - 8*B*a*b^4*c^
3*d^2 + 6*B*a^2*b^3*c^2*d^3)*x)*log((b*x + a)*e/(d*x + c)))/((b^11*c^3 - 3*
a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5*(a*b^10*c^3 - 3*a
^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 10*(a^2*b^9*c^3 - 3
*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 + 10*(a^3*b^8*c^3 -
 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2 + 5*(a^4*b^7*c^3
- 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x + (a^5*b^6*c^3 - 3
*a^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*g^6)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 1300 vs. $2(258) = 516$.

time = 86.47, size = 1300, normalized size = 4.63

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**6,x)
```

```
[Out] -B*d**5*i**2*log(x + (-B*a**4*d**9*i**2/(a*d - b*c)**3 + 4*B*a**3*b*c*d**8*
i**2/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**7*i**2/(a*d - b*c)**3 + 4*B*a*b
**3*c**3*d**6*i**2/(a*d - b*c)**3 + B*a*d**6*i**2 - B*b**4*c**4*d**5*i**2/(
a*d - b*c)**3 + B*b*c*d**5*i**2)/(2*B*b*d**6*i**2))/(30*b**3*g**6*(a*d - b*
c)**3) + B*d**5*i**2*log(x + (B*a**4*d**9*i**2/(a*d - b*c)**3 - 4*B*a**3*b*
c*d**8*i**2/(a*d - b*c)**3 + 6*B*a**2*b**2*c**2*d**7*i**2/(a*d - b*c)**3 -
4*B*a*b**3*c**3*d**6*i**2/(a*d - b*c)**3 + B*a*d**6*i**2 + B*b**4*c**4*d**5
*i**2/(a*d - b*c)**3 + B*b*c*d**5*i**2)/(2*B*b*d**6*i**2))/(30*b**3*g**6*(a
*d - b*c)**3) + (-60*A*a**4*d**4*i**2 - 60*A*a**3*b*c*d**3*i**2 - 60*A*a**2
*b**2*c**2*d**2*i**2 + 540*A*a*b**3*c**3*d*i**2 - 360*A*b**4*c**4*i**2 - 47
*B*a**4*d**4*i**2 - 47*B*a**3*b*c*d**3*i**2 - 47*B*a**2*b**2*c**2*d**2*i**2
 + 153*B*a*b**3*c**3*d*i**2 - 72*B*b**4*c**4*i**2 - 60*B*b**4*d**4*i**2*x**
4 + x**3*(-270*B*a*b**3*d**4*i**2 + 30*B*b**4*c*d**3*i**2) + x**2*(-600*A*a
**2*b**2*d**4*i**2 + 1200*A*a*b**3*c*d**3*i**2 - 600*A*b**4*c**2*d**2*i**2
- 470*B*a**2*b**2*d**4*i**2 + 130*B*a*b**3*c*d**3*i**2 - 20*B*b**4*c**2*d**
2*i**2) + x*(-300*A*a**3*b*d**4*i**2 - 300*A*a**2*b**2*c*d**3*i**2 + 1500*A
*a*b**3*c**2*d**2*i**2 - 900*A*b**4*c**3*d*i**2 - 235*B*a**3*b*d**4*i**2 -
235*B*a**2*b**2*c*d**3*i**2 + 365*B*a*b**3*c**2*d**2*i**2 - 135*B*b**4*c**3
*d*i**2))/(1800*a**7*b**3*d**2*g**6 - 3600*a**6*b**4*c*d*g**6 + 1800*a**5*b
**5*c**2*g**6 + x**5*(1800*a**2*b**8*d**2*g**6 - 3600*a*b**9*c*d*g**6 + 180
0*b**10*c**2*g**6) + x**4*(9000*a**3*b**7*d**2*g**6 - 18000*a**2*b**8*c*d*g
**6 + 9000*a*b**9*c**2*g**6) + x**3*(18000*a**4*b**6*d**2*g**6 - 36000*a**3
*b**7*c*d*g**6 + 18000*a**2*b**8*c**2*g**6) + x**2*(18000*a**5*b**5*d**2*g*
*6 - 36000*a**4*b**6*c*d*g**6 + 18000*a**3*b**7*c**2*g**6) + x*(9000*a**6*b
**4*d**2*g**6 - 18000*a**5*b**5*c*d*g**6 + 9000*a**4*b**6*c**2*g**6)) + (-B
*a**2*d**2*i**2 - 3*B*a*b*c*d*i**2 - 5*B*a*b*d**2*i**2*x - 6*B*b**2*c**2*i*
*2 - 15*B*b**2*c*d*i**2*x - 10*B*b**2*d**2*i**2*x**2)*log(e*(a + b*x)/(c +
d*x))/(30*a**5*b**3*g**6 + 150*a**4*b**4*g**6*x + 300*a**3*b**5*g**6*x**2 +
 300*a**2*b**6*g**6*x**3 + 150*a*b**7*g**6*x**4 + 30*b**8*g**6*x**5)
```

Giac [A]
time = 3.99, size = 382, normalized size = 1.36

$$\frac{\left(360\,Bb^{2}e^{6}\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{900\,(bxe+ae)Bbde^{5}\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{600\,(bxe+ae)^{2}Bd^{2}e^{4}\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^{2}}+360\,Ab^{2}e^{6}+72\,Bb^{2}e^{6}-\frac{900\,(bxe+ae)Abde^{5}}{dx+c}-\frac{225\,(bxe+ae)Bbde^{5}}{dx+c}+\frac{600\,(bxe+ae)^{2}Ad^{2}e^{4}}{(dx+c)^{2}}+\frac{200\,(bxe+ae)^{2}Bd^{2}e^{4}}{(dx+c)^{2}}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{1800\left(\frac{(bxe+ae)^{5}b^{2}c^{2}g^{6}}{(dx+c)^{5}}-\frac{2\,(bxe+ae)^{5}abcdg^{6}}{(dx+c)^{5}}+\frac{(bxe+ae)^{5}a^{2}d^{2}g^{6}}{(dx+c)^{5}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="giac")
```

```
[Out] 1/1800*(360*B*b^2*e^6*log((b*x*e + a*e)/(d*x + c)) - 900*(b*x*e + a*e)*B*b*
d*e^5*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 600*(b*x*e + a*e)^2*B*d^2*e^
4*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 360*A*b^2*e^6 + 72*B*b^2*e^6 -
 900*(b*x*e + a*e)*A*b*d*e^5/(d*x + c) - 225*(b*x*e + a*e)*B*b*d*e^5/(d*x +
 c) + 600*(b*x*e + a*e)^2*A*d^2*e^4/(d*x + c)^2 + 200*(b*x*e + a*e)^2*B*d^2
*e^4/(d*x + c)^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)
*(b*c - a*d)))/((b*x*e + a*e)^5*b^2*c^2*g^6/(d*x + c)^5 - 2*(b*x*e + a*e)^5
*a*b*c*d*g^6/(d*x + c)^5 + (b*x*e + a*e)^5*a^2*d^2*g^6/(d*x + c)^5)
```

Mupad [B]
time = 7.99, size = 941, normalized size = 3.35

$$\frac{B\,d^5\,i^2\,\mathrm{atanh}\left(\frac{30\,a^3\,b^3\,d^3\,g^6-30\,a^2\,b^4\,c\,d^2\,g^6-30\,a\,b^5\,c^2\,d\,g^6+30\,b^6\,c^3\,g^6}{30\,b^3\,g^6\,\left(a\,d-b\,c\right)^3}+\frac{2\,b\,d\,x\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}{\left(a\,d-b\,c\right)^3}\right)}{15\,b^3\,g^6\,\left(a\,d-b\,c\right)^3}-\frac{\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(a\,\left(\frac{B\,a\,d^2\,i^2}{30\,b^4\,g^6}+\frac{B\,c\,d\,i^2}{10\,b^3\,g^6}\right)+x\,\left(b\,\left(\frac{B\,a\,d^2\,i^2}{30\,b^4\,g^6}+\frac{B\,c\,d\,i^2}{10\,b^3\,g^6}\right)+\frac{2\,B\,a\,d^2\,i^2}{15\,b^3\,g^6}+\frac{2\,B\,c\,d\,i^2}{5\,b^2\,g^6}\right)+\frac{B\,c^2\,i^2}{5\,b^2\,g^6}+\frac{B\,d^2\,i^2\,x^2}{3\,b^2\,g^6}\right)}{5\,a^4\,x+\frac{a^5}{b}+b^4\,x^5+10\,a^3\,b\,x^2+5\,a\,b^3\,x^4+10\,a^2\,b^2\,x^3}-\frac{\frac{60\,A\,a^4\,d^4\,i^2+360\,A\,b^4\,c^4\,i^2+47\,B\,a^4\,d^4\,i^2+72\,B\,b^4\,c^4\,i^2+60\,A\,a^2\,b^2\,c^2\,d^2\,i^2+47\,B\,a^2\,b^2\,c^2\,d^2\,i^2-540\,A\,a\,b^3\,c^3\,d\,i^2+60\,A\,a^3\,b\,c\,d^3\,i^2-153\,B\,a\,b^3\,c^3\,d\,i^2+47\,B\,a^3\,b\,c\,d^3\,i^2}{60\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{x^2\,\left(60\,A\,a^2\,b^2\,d^4\,i^2+47\,B\,a^2\,b^2\,d^4\,i^2+60\,A\,b^4\,c^2\,d^2\,i^2+2\,B\,b^4\,c^2\,d^2\,i^2-120\,A\,a\,b^3\,c\,d^3\,i^2-13\,B\,a\,b^3\,c\,d^3\,i^2\right)}{6\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{x\,\left(60\,A\,a^3\,b\,d^4\,i^2+47\,B\,a^3\,b\,d^4\,i^2+180\,A\,b^4\,c^3\,d\,i^2+27\,B\,b^4\,c^3\,d\,i^2-300\,A\,a\,b^3\,c^2\,d^2\,i^2+60\,A\,a^2\,b^2\,c\,d^3\,i^2-73\,B\,a\,b^3\,c^2\,d^2\,i^2+47\,B\,a^2\,b^2\,c\,d^3\,i^2\right)}{12\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{d\,x^3\,\left(9\,B\,a\,b^3\,d^3\,i^2-B\,b^4\,c\,d^2\,i^2\right)}{2\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{B\,b^4\,d^4\,i^2\,x^4}{a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2}}{30\,a^5\,b^3\,g^6+150\,a^4\,b^4\,g^6\,x+300\,a^3\,b^5\,g^6\,x^2+300\,a^2\,b^6\,g^6\,x^3+150\,a\,b^7\,g^6\,x^4+30\,b^8\,g^6\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x))))/(a*g + b*g*x)^6,
x)
```

```
[Out] (B*d^5*i^2*atanh((30*b^6*c^3*g^6 + 30*a^3*b^3*d^3*g^6 - 30*a*b^5*c^2*d*g^6
- 30*a^2*b^4*c*d^2*g^6)/(30*b^3*g^6*(a*d - b*c)^3) + (2*b*d*x*(a^2*d^2 + b^
2*c^2 - 2*a*b*c*d))/(a*d - b*c)^3))/(15*b^3*g^6*(a*d - b*c)^3) - (log((e*(a
 + b*x))/(c + d*x))*(a*((B*a*d^2*i^2)/(30*b^4*g^6) + (B*c*d*i^2)/(10*b^3*g^
6)) + x*(b*((B*a*d^2*i^2)/(30*b^4*g^6) + (B*c*d*i^2)/(10*b^3*g^6)) + (2*B*a
*d^2*i^2)/(15*b^3*g^6) + (2*B*c*d*i^2)/(5*b^2*g^6)) + (B*c^2*i^2)/(5*b^2*g^
6) + (B*d^2*i^2*x^2)/(3*b^2*g^6)))/(5*a^4*x + a^5/b + b^4*x^5 + 10*a^3*b*x^
2 + 5*a*b^3*x^4 + 10*a^2*b^2*x^3) - ((60*A*a^4*d^4*i^2 + 360*A*b^4*c^4*i^2
+ 47*B*a^4*d^4*i^2 + 72*B*b^4*c^4*i^2 + 60*A*a^2*b^2*c^2*d^2*i^2 + 47*B*a^2
*b^2*c^2*d^2*i^2 - 540*A*a*b^3*c^3*d*i^2 + 60*A*a^3*b*c*d^3*i^2 - 153*B*a*b
^3*c^3*d*i^2 + 47*B*a^3*b*c*d^3*i^2)/(60*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) +
 (x^2*(60*A*a^2*b^2*d^4*i^2 + 47*B*a^2*b^2*d^4*i^2 + 60*A*b^4*c^2*d^2*i^2 +
 2*B*b^4*c^2*d^2*i^2 - 120*A*a*b^3*c*d^3*i^2 - 13*B*a*b^3*c*d^3*i^2))/(6*(a
^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (x*(60*A*a^3*b*d^4*i^2 + 47*B*a^3*b*d^4*i^
2 + 180*A*b^4*c^3*d*i^2 + 27*B*b^4*c^3*d*i^2 - 300*A*a*b^3*c^2*d^2*i^2 + 60
*A*a^2*b^2*c*d^3*i^2 - 73*B*a*b^3*c^2*d^2*i^2 + 47*B*a^2*b^2*c*d^3*i^2))/(1
2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (d*x^3*(9*B*a*b^3*d^3*i^2 - B*b^4*c*d^
2*i^2))/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (B*b^4*d^4*i^2*x^4)/(a^2*d^2
+ b^2*c^2 - 2*a*b*c*d))/(30*a^5*b^3*g^6 + 30*b^8*g^6*x^5 + 150*a^4*b^4*g^6*
x + 150*a*b^7*g^6*x^4 + 300*a^3*b^5*g^6*x^2 + 300*a^2*b^6*g^6*x^3)
```

3.20 $\int (ag+bgx)^3(ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=457

$$\frac{B(bc-ad)^6g^3i^3x}{140b^3d^3}+\frac{B(bc-ad)^5g^3i^3(c+dx)^2}{280b^2d^4}+\frac{B(bc-ad)^4g^3i^3(c+dx)^3}{420bd^4}-\frac{17B(bc-ad)^3g^3i^3(c+dx)^4}{280d^4}+\frac{bB\cdots}{\cdots}$$

```
[Out] 1/140*B*(-a*d+b*c)^6*g^3*i^3*x/b^3/d^3+1/280*B*(-a*d+b*c)^5*g^3*i^3*(d*x+c)
^2/b^2/d^4+1/420*B*(-a*d+b*c)^4*g^3*i^3*(d*x+c)^3/b/d^4-17/280*B*(-a*d+b*c)
^3*g^3*i^3*(d*x+c)^4/d^4+1/14*b*B*(-a*d+b*c)^2*g^3*i^3*(d*x+c)^5/d^4-1/42*b
^2*B*(-a*d+b*c)*g^3*i^3*(d*x+c)^6/d^4+1/140*B*(-a*d+b*c)^7*g^3*i^3*ln((b*x+
a)/(d*x+c))/b^4/d^4-1/4*(-a*d+b*c)^3*g^3*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d
*x+c)))/d^4+3/5*b*(-a*d+b*c)^2*g^3*i^3*(d*x+c)^5*(A+B*ln(e*(b*x+a)/(d*x+c))
)/d^4-1/2*b^2*(-a*d+b*c)*g^3*i^3*(d*x+c)^6*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^4+
1/7*b^3*g^3*i^3*(d*x+c)^7*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^4+1/140*B*(-a*d+b*c
)^7*g^3*i^3*ln(d*x+c)/b^4/d^4
```

Rubi [A]
time = 0.31, antiderivative size = 457, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2562, 45, 2382, 12, 1634}

$$\frac{b^3g^3i^3(c+dx)^7\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{7d^4}-\frac{b^2g^3i^3(c+dx)^6(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d^4}-\frac{g^3i^3(c+dx)^4(bc-ad)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^4}+\frac{3bg^3i^3(c+dx)^5(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^4}+\frac{Bg^3i^3(bc-ad)^7\log\left(\frac{a+bx}{c+dx}\right)}{140b^4d^4}+\frac{Bg^3i^3(bc-ad)^7\log(c+dx)}{140b^4d^4}+\frac{Bg^3i^3x(bc-ad)^6}{140b^3d^3}+\frac{Bg^3i^3(c+dx)^2(bc-ad)^5}{280b^2d^4}-\frac{b^2Bg^3i^3(c+dx)^6(bc-ad)}{42d^4}+\frac{Bg^3i^3(c+dx)^3(bc-ad)^4}{420bd^4}-\frac{17Bg^3i^3(c+dx)^4(bc-ad)^3}{280d^4}+\frac{bBg^3i^3(c+dx)^5(bc-ad)^2}{14d^4}$$

Antiderivative was successfully verified.

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

```
[Out] (B*(b*c - a*d)^6*g^3*i^3*x)/(140*b^3*d^3) + (B*(b*c - a*d)^5*g^3*i^3*(c + d
*x)^2)/(280*b^2*d^4) + (B*(b*c - a*d)^4*g^3*i^3*(c + d*x)^3)/(420*b*d^4) -
(17*B*(b*c - a*d)^3*g^3*i^3*(c + d*x)^4)/(280*d^4) + (b*B*(b*c - a*d)^2*g^3
*i^3*(c + d*x)^5)/(14*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*(c + d*x)^6)/(42*d^
4) + (B*(b*c - a*d)^7*g^3*i^3*Log[(a + b*x)/(c + d*x)])/(140*b^4*d^4) - ((b
*c - a*d)^3*g^3*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*d^
4) + (3*b*(b*c - a*d)^2*g^3*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d
*x)]))/(5*d^4) - (b^2*(b*c - a*d)*g^3*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(2*d^4) + (b^3*g^3*i^3*(c + d*x)^7*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(7*d^4) + (B*(b*c - a*d)^7*g^3*i^3*Log[c + d*x])/(140*b^4*d^
4)
```

Rule 12

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

Rule 45

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

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (20c+20dx)^3(ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx = \int \left(\frac{(-bc+ad)^3 g^3 (20c+20dx)^3 \left(A+B\log\right.}{d^3}\right.$$

$$= \frac{(b^3g^3)\int (20c+20dx)^6 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8000d^3}$$

$$= -\frac{2000(bc-ad)^3 g^3 (c+dx)^4 \left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{d^4}$$

$$= -\frac{2000(bc-ad)^3 g^3 (c+dx)^4 \left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{d^4}$$

$$= -\frac{2000(bc-ad)^3 g^3 (c+dx)^4 \left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{d^4}$$

$$= \frac{400B(bc-ad)^6 g^3 x}{7b^3d^3} + \frac{200B(bc-ad)^5 g^3 (c+}{7b^2d^4}$$

Mathematica [A]
time = 0.41, size = 586, normalized size = 1.28

$$\frac{g^3 i^3 \left(\frac{120b^2Bc(bc-ad)^5x}{d^3} - \frac{126bB(bc-ad)^6x}{d^3} + \frac{120abB(-bc+ad)^5x}{d^2} - \frac{60bBc(bc-ad)^4(a+bx)^2}{d^2} + \frac{60aB(bc-ad)^4(a+bx)^2}{d} + \frac{63B(bc-ad)^5(a+bx)^2}{d^2} + \frac{40bBc(bc-ad)^3(a+bx)^3}{d} - \frac{42B(bc-ad)^4(a+bx)^3}{d} + 40aB(-bc+ad)^3(a+bx)^3 - 30bBc(bc-ad)^2(a+bx)^4 + 30aBd(bc-ad)^2(a+bx)^4 + 21B(-bc+ad)^3(a+bx)^4 + 24bBcd(bc-ad)(a+bx)^5 - 84Bd(bc-ad)^2(a+bx)^5 + 24aBd^2(-bc+ad)(a+bx)^5 - 20bBcd^2(a+bx)^6 + 20aBd^3(a+bx)^6 + 210(bc-ad)^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) + 504d(bc-ad)^2(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) + 420d^2(bc-ad)(a+bx)^6\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) + 120d^3(a+bx)^7\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) - \frac{120bBc(bc-ad)^6\log(c+dx)}{d^4} + \frac{120aB(bc-ad)^6\log(c+dx)}{d^3} + \frac{126B(bc-ad)^7\log(c+dx)}{d^4}\right)}{840b^4}$$

Antiderivative was successfully verified.

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

```
[Out] (g^3*i^3*((120*b^2*B*c*(b*c - a*d)^5*x)/d^3 - (126*b*B*(b*c - a*d)^6*x)/d^3
 + (120*a*b*B*(-(b*c) + a*d)^5*x)/d^2 - (60*b*B*c*(b*c - a*d)^4*(a + b*x)^2
)/d^2 + (60*a*B*(b*c - a*d)^4*(a + b*x)^2)/d + (63*B*(b*c - a*d)^5*(a + b*x
)^2)/d^2 + (40*b*B*c*(b*c - a*d)^3*(a + b*x)^3)/d - (42*B*(b*c - a*d)^4*(a
+ b*x)^3)/d + 40*a*B*(-(b*c) + a*d)^3*(a + b*x)^3 - 30*b*B*c*(b*c - a*d)^2*
(a + b*x)^4 + 30*a*B*d*(b*c - a*d)^2*(a + b*x)^4 + 21*B*(-(b*c) + a*d)^3*(a
 + b*x)^4 + 24*b*B*c*d*(b*c - a*d)*(a + b*x)^5 - 84*B*d*(b*c - a*d)^2*(a +
b*x)^5 + 24*a*B*d^2*(-(b*c) + a*d)*(a + b*x)^5 - 20*b*B*c*d^2*(a + b*x)^6 +
 20*a*B*d^3*(a + b*x)^6 + 210*(b*c - a*d)^3*(a + b*x)^4*(A + B*Log[(e*(a +
b*x))/(c + d*x)]) + 504*d*(b*c - a*d)^2*(a + b*x)^5*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]) + 420*d^2*(b*c - a*d)*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]) + 120*d^3*(a + b*x)^7*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (120
*b*B*c*(b*c - a*d)^6*Log[c + d*x])/d^4 + (120*a*B*(b*c - a*d)^6*Log[c + d*x
])/d^3 + (126*B*(b*c - a*d)^7*Log[c + d*x])/d^4))/(840*b^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 20504 vs. $2(433) = 866$.
time = 0.71, size = 20505, normalized size = 44.87

method	result
risch	$\frac{9i^3g^3d^2b^2Aac\,x^5}{5}+\frac{9i^3g^3d^2bA\,a^2c\,x^4}{4}-\frac{3i^3g^3bB\,a^2c^3x^2}{10}-\frac{i^3g^3b^2Ba\,c^4x^2}{40d}+i^3g^3A\,a^3c^3x+\frac{9i^3g^3d\,b^2Aa\,c^2x^4}{4}$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2577 vs. $2(401) = 802$.
time = 0.36, size = 2577, normalized size = 5.64

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/7*I*A*b^3*d^3*g^3*x^7 - 1/2*I*A*b^3*c*d^2*g^3*x^6 - 1/2*I*A*a*b^2*d^3*g^
3*x^6 - 3/5*I*A*b^3*c^2*d*g^3*x^5 - 9/5*I*A*a*b^2*c*d^2*g^3*x^5 - 3/5*I*A*a
^2*b*d^3*g^3*x^5 - 1/4*I*A*b^3*c^3*g^3*x^4 - 9/4*I*A*a*b^2*c^2*d*g^3*x^4 -
9/4*I*A*a^2*b*c*d^2*g^3*x^4 - 1/4*I*A*a^3*d^3*g^3*x^4 - I*A*a*b^2*c^3*g^3*x
^3 - 3*I*A*a^2*b*c^2*d*g^3*x^3 - I*A*a^3*c*d^2*g^3*x^3 - 3/2*I*A*a^2*b*c^3*
g^3*x^2 - 3/2*I*A*a^3*c^2*d*g^3*x^2 - I*(x*log(b*x*e/(d*x + c) + a*e/(d*x +
 c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a^3*c^3*g^3 - 3/2*I*(x^2*log(
b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/
d^2 - (b*c - a*d)*x/(b*d))*B*a^2*b*c^3*g^3 - 1/2*I*(2*x^3*log(b*x*e/(d*x +
c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b
^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2*c^3*g^3
 - 1/24*I*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/
b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*
d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*c^3*g^3 - 3/
2*I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*
log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^3*c^2*d*g^3 - 3/2*I*(2*x^3*log(
b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x +
 c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*
a^2*b*c^2*d*g^3 - 3/8*I*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4
```

```
*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3
 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a*
b^2*c^2*d*g^3 - 1/20*I*(12*x^5*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 12*a^
5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x
^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12
*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^3*c^2*d*g^3 - 1/2*I*(2*x^3*log(b*x*e
/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d
^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^3*c
*d^2*g^3 - 3/8*I*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*
x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b
^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a^2*b*c*d
^2*g^3 - 3/20*I*(12*x^5*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b
*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*
(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c
^4 - a^4*d^4)*x)/(b^4*d^4))*B*a*b^2*c*d^2*g^3 - 1/120*I*(60*x^6*log(b*x*e/(
d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6*log(d*x + c)/d
^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 +
 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(
b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*B*b^3*c*d^2*g^3 - 1/24*I*(6*x^4*log(b*x*e/
(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^
4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3
*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a^3*d^3*g^3 - 1/20*I*(12*x^5*log(b*x*e/(d*x
 + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5
- (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b
^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*a^2*b*d^
3*g^3 - 1/120*I*(60*x^6*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b
*x + a)/b^6 + 60*c^6*log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 1
5*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30
*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*B*a*b^2
*d^3*g^3 - 1/420*I*(60*x^7*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 60*a^7*lo
g(b*x + a)/b^7 - 60*c^7*log(d*x + c)/d^7 - (10*(b^6*c*d^5 - a*b^5*d^6)*x^6
- 12*(b^6*c^2*d^4 - a^2*b^4*d^6)*x^5 + 15*(b^6*c^3*d^3 - a^3*b^3*d^6)*x^4 -
 20*(b^6*c^4*d^2 - a^4*b^2*d^6)*x^3 + 30*(b^6*c^5*d - a^5*b*d^6)*x^2 - 60*(
b^6*c^6 - a^6*d^6)*x)/(b^6*d^6))*B*b^3*d^3*g^3 - I*A*a^3*c^3*g^3*x
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 889 vs. $2(401) = 802$.
time = 0.61, size = 889, normalized size = 1.95

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/840*(-120*I*A*b^7*d^7*g^3*x^7 - 20*((21*I*A - I*B)*b^7*c*d^6 + (21*I*A +
I*B)*a*b^6*d^7)*g^3*x^6 - 12*((42*I*A - 5*I*B)*b^7*c^2*d^5 + 126*I*A*a*b^6*
c*d^6 + (42*I*A + 5*I*B)*a^2*b^5*d^7)*g^3*x^5 - 3*((70*I*A - 17*I*B)*b^7*c^
3*d^4 + 7*(90*I*A - 7*I*B)*a*b^6*c^2*d^5 + 7*(90*I*A + 7*I*B)*a^2*b^5*c*d^6
 + (70*I*A + 17*I*B)*a^3*b^4*d^7)*g^3*x^4 - 2*(-I*B*b^7*c^4*d^3 + 14*(30*I*
A - 7*I*B)*a*b^6*c^3*d^4 + 1260*I*A*a^2*b^5*c^2*d^5 + 14*(30*I*A + 7*I*B)*a
^3*b^4*c*d^6 + I*B*a^4*b^3*d^7)*g^3*x^3 - 3*(I*B*b^7*c^5*d^2 - 7*I*B*a*b^6*
c^4*d^3 + 84*(5*I*A - I*B)*a^2*b^5*c^3*d^4 + 84*(5*I*A + I*B)*a^3*b^4*c^2*d
^5 + 7*I*B*a^4*b^3*c*d^6 - I*B*a^5*b^2*d^7)*g^3*x^2 - 6*(-I*B*b^7*c^6*d + 7
*I*B*a*b^6*c^5*d^2 - 21*I*B*a^2*b^5*c^4*d^3 + 140*I*A*a^3*b^4*c^3*d^4 + 21*
I*B*a^4*b^3*c^2*d^5 - 7*I*B*a^5*b^2*c*d^6 + I*B*a^6*b*d^7)*g^3*x - 6*(35*I*
B*a^4*b^3*c^3*d^4 - 21*I*B*a^5*b^2*c^2*d^5 + 7*I*B*a^6*b*c*d^6 - I*B*a^7*d^
7)*g^3*log((b*x + a)/b) - 6*(I*B*b^7*c^7 - 7*I*B*a*b^6*c^6*d + 21*I*B*a^2*b
^5*c^5*d^2 - 35*I*B*a^3*b^4*c^4*d^3)*g^3*log((d*x + c)/d) - 6*(20*I*B*b^7*d
^7*g^3*x^7 + 140*I*B*a^3*b^4*c^3*d^4*g^3*x + 70*(I*B*b^7*c*d^6 + I*B*a*b^6*
d^7)*g^3*x^6 + 84*(I*B*b^7*c^2*d^5 + 3*I*B*a*b^6*c*d^6 + I*B*a^2*b^5*d^7)*g
^3*x^5 + 35*(I*B*b^7*c^3*d^4 + 9*I*B*a*b^6*c^2*d^5 + 9*I*B*a^2*b^5*c*d^6 +
I*B*a^3*b^4*d^7)*g^3*x^4 + 140*(I*B*a*b^6*c^3*d^4 + 3*I*B*a^2*b^5*c^2*d^5 +
 I*B*a^3*b^4*c*d^6)*g^3*x^3 + 210*(I*B*a^2*b^5*c^3*d^4 + I*B*a^3*b^4*c^2*d^
5)*g^3*x^2)*log((b*x + a)*e/(d*x + c)))/(b^4*d^4)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 2161 vs. $2(427) = 854$.
time = 18.01, size = 2161, normalized size = 4.73

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*b**3*d**3*g**3*i**3*x**7/7 - B*a**4*g**3*i**3*(a**3*d**3 - 7*a**2*b*c*d**
2 + 21*a*b**2*c**2*d - 35*b**3*c**3)*log(x + (B*a**7*c*d**6*g**3*i**3 - 7*B
*a**6*b*c**2*d**5*g**3*i**3 + 21*B*a**5*b**2*c**3*d**4*g**3*i**3 + B*a**5*d
**4*g**3*i**3*(a**3*d**3 - 7*a**2*b*c*d**2 + 21*a*b**2*c**2*d - 35*b**3*c**
3)/b - 70*B*a**4*b**3*c**4*d**3*g**3*i**3 - B*a**4*c*d**3*g**3*i**3*(a**3*d
**3 - 7*a**2*b*c*d**2 + 21*a*b**2*c**2*d - 35*b**3*c**3) + 21*B*a**3*b**4*c
**5*d**2*g**3*i**3 - 7*B*a**2*b**5*c**6*d*g**3*i**3 + B*a*b**6*c**7*g**3*i*
*3)/(B*a**7*d**7*g**3*i**3 - 7*B*a**6*b*c*d**6*g**3*i**3 + 21*B*a**5*b**2*c
**2*d**5*g**3*i**3 - 35*B*a**4*b**3*c**3*d**4*g**3*i**3 - 35*B*a**3*b**4*c*
*4*d**3*g**3*i**3 + 21*B*a**2*b**5*c**5*d**2*g**3*i**3 - 7*B*a*b**6*c**6*d*
g**3*i**3 + B*b**7*c**7*g**3*i**3))/(140*b**4) - B*c**4*g**3*i**3*(35*a**3*
d**3 - 21*a**2*b*c*d**2 + 7*a*b**2*c**2*d - b**3*c**3)*log(x + (B*a**7*c*d*
*6*g**3*i**3 - 7*B*a**6*b*c**2*d**5*g**3*i**3 + 21*B*a**5*b**2*c**3*d**4*g*
*3*i**3 - 70*B*a**4*b**3*c**4*d**3*g**3*i**3 + 21*B*a**3*b**4*c**5*d**2*g**
3*i**3 - 7*B*a**2*b**5*c**6*d*g**3*i**3 + B*a*b**6*c**7*g**3*i**3 + B*a*b**
```

```
3*c**4*g**3*i**3*(35*a**3*d**3 - 21*a**2*b*c*d**2 + 7*a*b**2*c**2*d - b**3*
c**3) - B*b**4*c**5*g**3*i**3*(35*a**3*d**3 - 21*a**2*b*c*d**2 + 7*a*b**2*c
**2*d - b**3*c**3)/d)/(B*a**7*d**7*g**3*i**3 - 7*B*a**6*b*c*d**6*g**3*i**3
+ 21*B*a**5*b**2*c**2*d**5*g**3*i**3 - 35*B*a**4*b**3*c**3*d**4*g**3*i**3 -
 35*B*a**3*b**4*c**4*d**3*g**3*i**3 + 21*B*a**2*b**5*c**5*d**2*g**3*i**3 -
7*B*a*b**6*c**6*d*g**3*i**3 + B*b**7*c**7*g**3*i**3))/(140*d**4) + x**6*(A*
a*b**2*d**3*g**3*i**3/2 + A*b**3*c*d**2*g**3*i**3/2 + B*a*b**2*d**3*g**3*i*
*3/42 - B*b**3*c*d**2*g**3*i**3/42) + x**5*(3*A*a**2*b*d**3*g**3*i**3/5 + 9
*A*a*b**2*c*d**2*g**3*i**3/5 + 3*A*b**3*c**2*d*g**3*i**3/5 + B*a**2*b*d**3*
g**3*i**3/14 - B*b**3*c**2*d*g**3*i**3/14) + x**4*(A*a**3*d**3*g**3*i**3/4
+ 9*A*a**2*b*c*d**2*g**3*i**3/4 + 9*A*a*b**2*c**2*d*g**3*i**3/4 + A*b**3*c*
*3*g**3*i**3/4 + 17*B*a**3*d**3*g**3*i**3/280 + 7*B*a**2*b*c*d**2*g**3*i**3
/40 - 7*B*a*b**2*c**2*d*g**3*i**3/40 - 17*B*b**3*c**3*g**3*i**3/280) + x**3
*(A*a**3*c*d**2*g**3*i**3 + 3*A*a**2*b*c**2*d*g**3*i**3 + A*a*b**2*c**3*g**
3*i**3 + B*a**4*d**3*g**3*i**3/(420*b) + 7*B*a**3*c*d**2*g**3*i**3/30 - 7*B
*a*b**2*c**3*g**3*i**3/30 - B*b**3*c**4*g**3*i**3/(420*d)) + x**2*(3*A*a**3
*c**2*d*g**3*i**3/2 + 3*A*a**2*b*c**3*g**3*i**3/2 - B*a**5*d**3*g**3*i**3/(
280*b**2) + B*a**4*c*d**2*g**3*i**3/(40*b) + 3*B*a**3*c**2*d*g**3*i**3/10 -
 3*B*a**2*b*c**3*g**3*i**3/10 - B*a*b**2*c**4*g**3*i**3/(40*d) + B*b**3*c**
5*g**3*i**3/(280*d**2)) + x*(A*a**3*c**3*g**3*i**3 + B*a**6*d**3*g**3*i**3/
(140*b**3) - B*a**5*c*d**2*g**3*i**3/(20*b**2) + 3*B*a**4*c**2*d*g**3*i**3/
(20*b) - 3*B*a**2*b*c**4*g**3*i**3/(20*d) + B*a*b**2*c**5*g**3*i**3/(20*d**
2) - B*b**3*c**6*g**3*i**3/(140*d**3)) + (B*a**3*c**3*g**3*i**3*x + 3*B*a**
3*c**2*d*g**3*i**3*x**2/2 + B*a**3*c*d**2*g**3*i**3*x**3 + B*a**3*d**3*g**3
*i**3*x**4/4 + 3*B*a**2*b*c**3*g**3*i**3*x**2/2 + 3*B*a**2*b*c**2*d*g**3*i*
*3*x**3 + 9*B*a**2*b*c*d**2*g**3*i**3*x**4/4 + 3*B*a**2*b*d**3*g**3*i**3*x*
*5/5 + B*a*b**2*c**3*g**3*i**3*x**3 + 9*B*a*b**2*c**2*d*g**3*i**3*x**4/4 +
9*B*a*b**2*c*d**2*g**3*i**3*x**5/5 + B*a*b**2*d**3*g**3*i**3*x**6/2 + B*b**
3*c**3*g**3*i**3*x**4/4 + 3*B*b**3*c**2*d*g**3*i**3*x**5/5 + B*b**3*c*d**2*
g**3*i**3*x**6/2 + B*b**3*d**3*g**3*i**3*x**7/7)*log(e*(a + b*x)/(c + d*x))
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 9900 vs. $2(401) = 802$.
time = 4.14, size = 9900, normalized size = 21.66

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/840*(6*I*B*b^15*c^8*g^3*e^8*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 48*I*
B*a*b^14*c^7*d*g^3*e^8*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 168*I*B*a^2*
b^13*c^6*d^2*g^3*e^8*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 336*I*B*a^3*b^
12*c^5*d^3*g^3*e^8*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 420*I*B*a^4*b^11
```

*c^4*d^4*g^3*e^8*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 336*I*B*a^5*b^10*c
^3*d^5*g^3*e^8*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 168*I*B*a^6*b^9*c^2*
d^6*g^3*e^8*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 48*I*B*a^7*b^8*c*d^7*g^
3*e^8*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 6*I*B*a^8*b^7*d^8*g^3*e^8*log
(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 42*I*(b*x*e + a*e)*B*b^14*c^8*d*g^3*e^
7*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 336*I*(b*x*e + a*e)*B*a
*b^13*c^7*d^2*g^3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 117
6*I*(b*x*e + a*e)*B*a^2*b^12*c^6*d^3*g^3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*
x + c))/(d*x + c) + 2352*I*(b*x*e + a*e)*B*a^3*b^11*c^5*d^4*g^3*e^7*log(-b*
e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 2940*I*(b*x*e + a*e)*B*a^4*b^10*
c^4*d^5*g^3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 2352*I*(b
*x*e + a*e)*B*a^5*b^9*c^3*d^6*g^3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c))
/(d*x + c) - 1176*I*(b*x*e + a*e)*B*a^6*b^8*c^2*d^7*g^3*e^7*log(-b*e + (b*x
*e + a*e)*d/(d*x + c))/(d*x + c) + 336*I*(b*x*e + a*e)*B*a^7*b^7*c*d^8*g^3*
e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 42*I*(b*x*e + a*e)*B*
a^8*b^6*d^9*g^3*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 126*I
*(b*x*e + a*e)^2*B*b^13*c^8*d^2*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c
))/(d*x + c)^2 - 1008*I*(b*x*e + a*e)^2*B*a*b^12*c^7*d^3*g^3*e^6*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 3528*I*(b*x*e + a*e)^2*B*a^2*b^11
*c^6*d^4*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 7056*I
*(b*x*e + a*e)^2*B*a^3*b^10*c^5*d^5*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^2 + 8820*I*(b*x*e + a*e)^2*B*a^4*b^9*c^4*d^6*g^3*e^6*log(-
b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 7056*I*(b*x*e + a*e)^2*B*a^5
*b^8*c^3*d^7*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 35
28*I*(b*x*e + a*e)^2*B*a^6*b^7*c^2*d^8*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(
d*x + c))/(d*x + c)^2 - 1008*I*(b*x*e + a*e)^2*B*a^7*b^6*c*d^9*g^3*e^6*log(
-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 126*I*(b*x*e + a*e)^2*B*a^8
*b^5*d^10*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 210*I
*(b*x*e + a*e)^3*B*b^12*c^8*d^3*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c
))/(d*x + c)^3 + 1680*I*(b*x*e + a*e)^3*B*a*b^11*c^7*d^4*g^3*e^5*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 5880*I*(b*x*e + a*e)^3*B*a^2*b^10
*c^6*d^5*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 11760*
I*(b*x*e + a*e)^3*B*a^3*b^9*c^5*d^6*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^3 - 14700*I*(b*x*e + a*e)^3*B*a^4*b^8*c^4*d^7*g^3*e^5*log(
-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 11760*I*(b*x*e + a*e)^3*B*a
^5*b^7*c^3*d^8*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 -
5880*I*(b*x*e + a*e)^3*B*a^6*b^6*c^2*d^9*g^3*e^5*log(-b*e + (b*x*e + a*e)*d
/(d*x + c))/(d*x + c)^3 + 1680*I*(b*x*e + a*e)^3*B*a^7*b^5*c*d^10*g^3*e^5*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 210*I*(b*x*e + a*e)^3*B*
a^8*b^4*d^11*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 21
0*I*(b*x*e + a*e)^4*B*b^11*c^8*d^4*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^4 - 1680*I*(b*x*e + a*e)^4*B*a*b^10*c^7*d^5*g^3*e^4*log(-b*
e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 5880*I*(b*x*e + a*e)^4*B*a^2*b
^9*c^6*d^6*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 1176
0*I*(b*x*e + a*e)^4*B*a^3*b^8*c^5*d^7*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d

```
*x + c))/(d*x + c)^4 + 14700*I*(b*x*e + a*e)^4*B*a^4*b^7*c^4*d^8*g^3*e^4*lo
g(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 11760*I*(b*x*e + a*e)^4*B
*a^5*b^6*c^3*d^9*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4
+ 5880*I*(b*x*e + a*e)^4*B*a^6*b^5*c^2*d^10*g^3*e^4*log(-b*e + (b*x*e + a*e
)*d/(d*x + c))/(d*x + c)^4 - 1680*I*(b*x*e + a*e)^4*B*a^7*b^4*c*d^11*g^3*e^
4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 210*I*(b*x*e + a*e)^4
*B*a^8*b^3*d^12*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 -
 126*I*(b*x*e + a*e)^5*B*b^10*c^8*d^5*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d
*x + c))/(d*x + c)^5 + 1008*I*(b*x*e + a*e)^5*B*a*b^9*c^7*d^6*g^3*e^3*log(-
b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 3528*I*(b*x*e + a*e)^5*B*a^2
*b^8*c^6*d^7*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 70
56*I*(b*x*e + a*e)^5*B*a^3*b^7*c^5*d^8*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(
d*x + c))/(d*x + c)^5 - 8820*I*(b*x*e + a*e)^5*B*a^4*b^6*c^4*d^9*g^3*e^3*lo
g(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 7056*I*(b*x*e + a*e)^5*B*
a^5*b^5*c^3*d^10*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5
- 3528*I*(b*x*e + a*e)^5*B*a^6*b^4*c^2*d^11*g^3*e^3*log(-b*e + (b*x*e + a*e
)*d/(d*x + c))/(d*x + c)^5 + 1008*I*(b*x*e + a*e)^5*B*a^7*b^3*c*d^12*g^3*e^
3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + ...
```

Mupad [B]
time = 6.58, size = 2500, normalized size = 5.47

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(((140*a*d + 140*b*c)*(((140*a*d + 140*b*c)*((a*c*((((b^2*d^2*g^3*i^3*(28
*A*a*d + 28*A*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b
*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12*
A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^3*i^
3))/(b*d) - ((140*a*d + 140*b*c)*((g^3*i^3*(20*A*a^3*d^3 + 20*A*b^3*c^3 + 3
*B*a^3*d^3 - 3*B*b^3*c^3 + 120*A*a*b^2*c^2*d + 120*A*a^2*b*c*d^2 - 6*B*a*b^
2*c^2*d + 6*B*a^2*b*c*d^2))/5 + ((140*a*d + 140*b*c)*((((b^2*d^2*g^3*i^3*(2
8*A*a*d + 28*A*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*
b*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12
*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^3*i
^3))/(140*b*d) - (a*c*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B*b*
c))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140))/(b*d)))/(140*b*d) + (
g^3*i^3*(4*A*a^4*d^4 + 4*A*b^4*c^4 + B*a^4*d^4 - B*b^4*c^4 + 144*A*a^2*b^2*
c^2*d^2 + 64*A*a*b^3*c^3*d + 64*A*a^3*b*c*d^3 - 8*B*a*b^3*c^3*d + 8*B*a^3*b
*c*d^3))/(4*b*d)))/(140*b*d) + (a*c*((g^3*i^3*(20*A*a^3*d^3 + 20*A*b^3*c^3
+ 3*B*a^3*d^3 - 3*B*b^3*c^3 + 120*A*a*b^2*c^2*d + 120*A*a^2*b*c*d^2 - 6*B*a
*b^2*c^2*d + 6*B*a^2*b*c*d^2))/5 + ((140*a*d + 140*b*c)*((((b^2*d^2*g^3*i^3
*(28*A*a*d + 28*A*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 1
```

40*b*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 +
 12*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^
3*i^3))/(140*b*d) - (a*c*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B
*b*c))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140))/(b*d)))/(b*d) - (a
*c*g^3*i^3*(4*A*a^3*d^3 + 4*A*b^3*c^3 + B*a^3*d^3 - B*b^3*c^3 + 24*A*a*b^2*
c^2*d + 24*A*a^2*b*c*d^2 - 2*B*a*b^2*c^2*d + 2*B*a^2*b*c*d^2))/(b*d)))/(140
*b*d) - (a*c*((a*c*((((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B*b*c
))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(1
40*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2
 + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^3*i^3))/(b*d) - ((140*a*d + 140*b*c)*
((g^3*i^3*(20*A*a^3*d^3 + 20*A*b^3*c^3 + 3*B*a^3*d^3 - 3*B*b^3*c^3 + 120*A*
a*b^2*c^2*d + 120*A*a^2*b*c*d^2 - 6*B*a*b^2*c^2*d + 6*B*a^2*b*c*d^2))/5 + (
(140*a*d + 140*b*c)*((((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B*b*
c))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(
140*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^
2 + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^3*i^3))/(140*b*d) - (a*c*((b^2*d^2*g
^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3*i^3*(140*a
*d + 140*b*c))/140))/(b*d)))/(140*b*d) + (g^3*i^3*(4*A*a^4*d^4 + 4*A*b^4*c^
4 + B*a^4*d^4 - B*b^4*c^4 + 144*A*a^2*b^2*c^2*d^2 + 64*A*a*b^3*c^3*d + 64*A
*a^3*b*c*d^3 - 8*B*a*b^3*c^3*d + 8*B*a^3*b*c*d^3))/(4*b*d)))/(b*d) + (a^2*c
^2*g^3*i^3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + 3*B*a^2*d^2 - 3*B*b^2*c^2 + 32*A*
a*b*c*d))/(2*b*d)) + x^6*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B
*b*c))/42 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/840) + x^3*((a*c*((((b^
2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3*i^3
*(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(1
2*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d))/2 + A*a
*b^2*c*d^2*g^3*i^3))/(3*b*d) - ((140*a*d + 140*b*c)*((g^3*i^3*(20*A*a^3*d^3
 + 20*A*b^3*c^3 + 3*B*a^3*d^3 - 3*B*b^3*c^3 + 120*A*a*b^2*c^2*d + 120*A*a^2
*b*c*d^2 - 6*B*a*b^2*c^2*d + 6*B*a^2*b*c*d^2))/5 + ((140*a*d + 140*b*c)*(((
(b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3*
i^3*(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3
*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d))/2 +
A*a*b^2*c*d^2*g^3*i^3))/(140*b*d) - (a*c*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A
*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140))/(b
*d)))/(420*b*d) + (g^3*i^3*(4*A*a^4*d^4 + 4*A*b^4*c^4 + B*a^4*d^4 - B*b^4*c
^4 + 144*A*a^2*b^2*c^2*d^2 + 64*A*a*b^3*c^3*d + 64*A*a^3*b*c*d^3 - 8*B*a*b^
3*c^3*d + 8*B*a^3*b*c*d^3))/(12*b*d)) - x^2*(((140*a*d + 140*b*c)*((a*c*(((
(b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3*
i^3*(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3
*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d))/2 +
A*a*b^2*c*d^2*g^3*i^3))/(b*d) - ((140*a*d + 140*b*c)*((g^3*i^3*(20*A*a^3*d^
3 + 20*A*b^3*c^3 + 3*B*a^3*d^3 - 3*B*b^3*c^3 + 120*A*a*b^2*c^2*d + 120*A*a^
2*b*c*d^2 - 6*B*a*b^2*c^2*d + 6*B*a^2*b*c*d^2))/5 + ((140*a*d + 140*b*c)*((
((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3
i^3(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^

```
3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 32*A*a*b*c*d))/2 +
 A*a*b^2*c*d^2*g^3*i^3))/(140*b*d) - (a*c*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*
A*b*c + B*a*d - B*b*c))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140))/(
b*d)))/(140*b*d) + (g^3*i^3*(4*A*a^4*d^4 + 4*A*...
```

3.21 $\int (ag+bgx)^2(ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=371

$$-\frac{B(bc-ad)^5g^2i^3x}{60b^3d^2}-\frac{B(bc-ad)^4g^2i^3(c+dx)^2}{120b^2d^3}-\frac{B(bc-ad)^3g^2i^3(c+dx)^3}{180bd^3}+\frac{7B(bc-ad)^2g^2i^3(c+dx)^4}{120d^3}-bB$$

```
[Out] -1/60*B*(-a*d+b*c)^5*g^2*i^3*x/b^3/d^2-1/120*B*(-a*d+b*c)^4*g^2*i^3*(d*x+c)
^2/b^2/d^3-1/180*B*(-a*d+b*c)^3*g^2*i^3*(d*x+c)^3/b/d^3+7/120*B*(-a*d+b*c)^
2*g^2*i^3*(d*x+c)^4/d^3-1/30*b*B*(-a*d+b*c)*g^2*i^3*(d*x+c)^5/d^3-1/60*B*(-
a*d+b*c)^6*g^2*i^3*ln((b*x+a)/(d*x+c))/b^4/d^3+1/4*(-a*d+b*c)^2*g^2*i^3*(d*
x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3-2/5*b*(-a*d+b*c)*g^2*i^3*(d*x+c)^5*(
A+B*ln(e*(b*x+a)/(d*x+c)))/d^3+1/6*b^2*g^2*i^3*(d*x+c)^6*(A+B*ln(e*(b*x+a)/
(d*x+c)))/d^3-1/60*B*(-a*d+b*c)^6*g^2*i^3*ln(d*x+c)/b^4/d^3
```

Rubi [A]
time = 0.24, antiderivative size = 371, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2562, 45, 2382, 12, 907}

$$\frac{b^2g^2i^3(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6d^3}+\frac{g^2i^3(c+dx)^4(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^3}-\frac{2bg^2i^3(c+dx)^5(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^3}-\frac{Bg^2i^3(bc-ad)^6\log\left(\frac{a+bx}{c+dx}\right)}{60b^4d^3}-\frac{Bg^2i^3(bc-ad)^6\log(c+dx)}{60b^4d^3}-\frac{Bg^2i^3x(bc-ad)^5}{60b^3d^2}-\frac{Bg^2i^3(c+dx)^2(bc-ad)^4}{120b^2d^3}-\frac{Bg^2i^3(c+dx)^3(bc-ad)^3}{180bd^3}+\frac{7Bg^2i^3(c+dx)^4(bc-ad)^2}{120d^3}-\frac{bBg^2i^3(c+dx)^5(bc-ad)}{30d^3}$$

Antiderivative was successfully verified.

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

```
[Out] -1/60*(B*(b*c - a*d)^5*g^2*i^3*x)/(b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*(c +
 d*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(180*b*d^3)
+ (7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a*d)*g^2*
i^3*(c + d*x)^5)/(30*d^3) - (B*(b*c - a*d)^6*g^2*i^3*Log[(a + b*x)/(c + d*x
)])/(60*b^4*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/(6*d^3) - (B*(b*c - a*d)^6*g^2*i^3*Log[c + d*x])/(
60*b^4*d^3)
```

Rule 12

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

Rule 45

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

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

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (21c+21dx)^3(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx = \int \left(\frac{(-bc+ad)^2g^2(21c+21dx)^3\left(A+B\log\left(\right.\right.}{d^2}\right.$$

$$= \frac{(b^2g^2)\int(21c+21dx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{441d^2}$$

$$= \frac{9261(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{4d^3}$$

$$= \frac{9261(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{4d^3}$$

$$= \frac{9261(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{4d^3}$$

$$= -\frac{3087B(bc-ad)^5g^2x}{20b^3d^2} - \frac{3087B(bc-ad)^4g^2(c}{40b^2d^3}$$

Mathematica [A]
time = 0.22, size = 429, normalized size = 1.16

$$\frac{g^2i^3\left(-15B(bc-ad)^3\left(6bd(bc-ad)^2x+3b^2(bc-ad)(c+dx)^2+2b^3(c+dx)^3+6(bc-ad)^3\log(a+bx)\right)+12B(bc-ad)^2\left(12bd(bc-ad)^3x+6b^2(bc-ad)^2(c+dx)^2+4b^3(bc-ad)(c+dx)^3+3b^4(c+dx)^4+12(bc-ad)^4\log(a+bx)\right)-B(bc-ad)\left(60bd(bc-ad)^4x+30b^2(bc-ad)^3(c+dx)^2+20b^3(bc-ad)^2(c+dx)^3+15b^4(bc-ad)(c+dx)^4+12b^5(c+dx)^5+60(bc-ad)^5\log(a+bx)\right)+90b^4(bc-ad)^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-144b^5(bc-ad)(c+dx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+60b^6(c+dx)^6\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\right)}{360b^4d^3}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 12390 vs. 2(351) = 702.
time = 0.69, size = 12391, normalized size = 33.40

method	result
risch	$\frac{i^3 g^2 B x (10 d^3 b^2 x^5 + 24ab\, d^3 x^4 + 36 b^2 c\, d^2 x^4 + 15 a^2 d^3 x^3 + 90abc\, d^2 x^3 + 45 b^2 c^2 d\, x^3 + 60 a^2 c\, d^2 x^2 + 120ab\, c^2 d\, x^2 + 20 b^2 c^3 x^2 +}{60}$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1747 vs. $2(324) = 648$.
time = 0.36, size = 1747, normalized size = 4.71

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 701 vs. $2(324) = 648$.
time = 0.49, size = 701, normalized size = 1.89

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 1727 vs. $2(347) = 694$.
time = 8.48, size = 1727, normalized size = 4.65

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*b**2*d**3*g**2*i**3*x**6/6 - B*a**3*g**2*i**3*(a**3*d**3 - 6*a**2*b*c*d**
2 + 15*a*b**2*c**2*d - 20*b**3*c**3)*log(x + (B*a**6*c*d**5*g**2*i**3 - 6*B
*a**5*b*c**2*d**4*g**2*i**3 + 15*B*a**4*b**2*c**3*d**3*g**2*i**3 + B*a**4*d
**3*g**2*i**3*(a**3*d**3 - 6*a**2*b*c*d**2 + 15*a*b**2*c**2*d - 20*b**3*c**
3)/b - 35*B*a**3*b**3*c**4*d**2*g**2*i**3 - B*a**3*c*d**2*g**2*i**3*(a**3*d
**3 - 6*a**2*b*c*d**2 + 15*a*b**2*c**2*d - 20*b**3*c**3) + 6*B*a**2*b**4*c*
*5*d*g**2*i**3 - B*a*b**5*c**6*g**2*i**3)/(B*a**6*d**6*g**2*i**3 - 6*B*a**5
*b*c*d**5*g**2*i**3 + 15*B*a**4*b**2*c**2*d**4*g**2*i**3 - 20*B*a**3*b**3*c
**3*d**3*g**2*i**3 - 15*B*a**2*b**4*c**4*d**2*g**2*i**3 + 6*B*a*b**5*c**5*d
*g**2*i**3 - B*b**6*c**6*g**2*i**3))/(60*b**4) - B*c**4*g**2*i**3*(15*a**2*
d**2 - 6*a*b*c*d + b**2*c**2)*log(x + (B*a**6*c*d**5*g**2*i**3 - 6*B*a**5*b
*c**2*d**4*g**2*i**3 + 15*B*a**4*b**2*c**3*d**3*g**2*i**3 - 35*B*a**3*b**3*
c**4*d**2*g**2*i**3 + 6*B*a**2*b**4*c**5*d*g**2*i**3 - B*a*b**5*c**6*g**2*i
**3 + B*a*b**3*c**4*g**2*i**3*(15*a**2*d**2 - 6*a*b*c*d + b**2*c**2) - B*b*
*4*c**5*g**2*i**3*(15*a**2*d**2 - 6*a*b*c*d + b**2*c**2)/d)/(B*a**6*d**6*g*
*2*i**3 - 6*B*a**5*b*c*d**5*g**2*i**3 + 15*B*a**4*b**2*c**2*d**4*g**2*i**3
- 20*B*a**3*b**3*c**3*d**3*g**2*i**3 - 15*B*a**2*b**4*c**4*d**2*g**2*i**3 +
 6*B*a*b**5*c**5*d*g**2*i**3 - B*b**6*c**6*g**2*i**3))/(60*d**3) + x**5*(2*
A*a*b*d**3*g**2*i**3/5 + 3*A*b**2*c*d**2*g**2*i**3/5 + B*a*b*d**3*g**2*i**3
/30 - B*b**2*c*d**2*g**2*i**3/30) + x**4*(A*a**2*d**3*g**2*i**3/4 + 3*A*a*b
*c*d**2*g**2*i**3/2 + 3*A*b**2*c**2*d*g**2*i**3/4 + 7*B*a**2*d**3*g**2*i**3
/120 + B*a*b*c*d**2*g**2*i**3/20 - 13*B*b**2*c**2*d*g**2*i**3/120) + x**3*(
A*a**2*c*d**2*g**2*i**3 + 2*A*a*b*c**2*d*g**2*i**3 + A*b**2*c**3*g**2*i**3/
3 + B*a**3*d**3*g**2*i**3/(180*b) + 13*B*a**2*c*d**2*g**2*i**3/60 - 7*B*a*b
*c**2*d*g**2*i**3/60 - 19*B*b**2*c**3*g**2*i**3/180) + x**2*(3*A*a**2*c**2*
d*g**2*i**3/2 + A*a*b*c**3*g**2*i**3 - B*a**4*d**3*g**2*i**3/(120*b**2) + B
*a**3*c*d**2*g**2*i**3/(20*b) + B*a**2*c**2*d*g**2*i**3/4 - 17*B*a*b*c**3*g
**2*i**3/60 - B*b**2*c**4*g**2*i**3/(120*d)) + x*(A*a**2*c**3*g**2*i**3 + B
*a**5*d**3*g**2*i**3/(60*b**3) - B*a**4*c*d**2*g**2*i**3/(10*b**2) + B*a**3
*c**2*d*g**2*i**3/(4*b) - B*a**2*c**3*g**2*i**3/12 - B*a*b*c**4*g**2*i**3/(
10*d) + B*b**2*c**5*g**2*i**3/(60*d**2)) + (B*a**2*c**3*g**2*i**3*x + 3*B*a
**2*c**2*d*g**2*i**3*x**2/2 + B*a**2*c*d**2*g**2*i**3*x**3 + B*a**2*d**3*g*
*2*i**3*x**4/4 + B*a*b*c**3*g**2*i**3*x**2 + 2*B*a*b*c**2*d*g**2*i**3*x**3
+ 3*B*a*b*c*d**2*g**2*i**3*x**4/2 + 2*B*a*b*d**3*g**2*i**3*x**5/5 + B*b**2*
c**3*g**2*i**3*x**3/3 + 3*B*b**2*c**2*d*g**2*i**3*x**4/4 + 3*B*b**2*c*d**2*
g**2*i**3*x**5/5 + B*b**2*d**3*g**2*i**3*x**6/6)*log(e*(a + b*x)/(c + d*x))
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 7803 vs. $2(324) = 648$.
time = 3.74, size = 7803, normalized size = 21.03

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/360*(-6*I*B*b^13*c^7*g^2*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 42*I
*B*a*b^12*c^6*d*g^2*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 126*I*B*a^2
*b^11*c^5*d^2*g^2*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 210*I*B*a^3*b
^10*c^4*d^3*g^2*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 210*I*B*a^4*b^9
*c^3*d^4*g^2*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 126*I*B*a^5*b^8*c^
2*d^5*g^2*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 42*I*B*a^6*b^7*c*d^6*
g^2*e^7*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 6*I*B*a^7*b^6*d^7*g^2*e^7*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 36*I*(b*x*e + a*e)*B*b^12*c^7*d*g^2*
e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 252*I*(b*x*e + a*e)*B
*a*b^11*c^6*d^2*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 7
56*I*(b*x*e + a*e)*B*a^2*b^10*c^5*d^3*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d
*x + c))/(d*x + c) - 1260*I*(b*x*e + a*e)*B*a^3*b^9*c^4*d^4*g^2*e^6*log(-b*
e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 1260*I*(b*x*e + a*e)*B*a^4*b^8*c
^3*d^5*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 756*I*(b*x
*e + a*e)*B*a^5*b^7*c^2*d^6*g^2*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(
d*x + c) + 252*I*(b*x*e + a*e)*B*a^6*b^6*c*d^7*g^2*e^6*log(-b*e + (b*x*e +
a*e)*d/(d*x + c))/(d*x + c) - 36*I*(b*x*e + a*e)*B*a^7*b^5*d^8*g^2*e^6*log(
-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 90*I*(b*x*e + a*e)^2*B*b^11*c
^7*d^2*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 630*I*(b
*x*e + a*e)^2*B*a*b^10*c^6*d^3*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)
)/(d*x + c)^2 - 1890*I*(b*x*e + a*e)^2*B*a^2*b^9*c^5*d^4*g^2*e^5*log(-b*e +
 (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 3150*I*(b*x*e + a*e)^2*B*a^3*b^8*
c^4*d^5*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 3150*I*
(b*x*e + a*e)^2*B*a^4*b^7*c^3*d^6*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x +
 c))/(d*x + c)^2 + 1890*I*(b*x*e + a*e)^2*B*a^5*b^6*c^2*d^7*g^2*e^5*log(-b*
e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 630*I*(b*x*e + a*e)^2*B*a^6*b^
5*c*d^8*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 90*I*(b
*x*e + a*e)^2*B*a^7*b^4*d^9*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(
d*x + c)^2 + 120*I*(b*x*e + a*e)^3*B*b^10*c^7*d^3*g^2*e^4*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^3 - 840*I*(b*x*e + a*e)^3*B*a*b^9*c^6*d^4*g^
2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 2520*I*(b*x*e + a
*e)^3*B*a^2*b^8*c^5*d^5*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
+ c)^3 - 4200*I*(b*x*e + a*e)^3*B*a^3*b^7*c^4*d^6*g^2*e^4*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^3 + 4200*I*(b*x*e + a*e)^3*B*a^4*b^6*c^3*d^7
*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 2520*I*(b*x*e
+ a*e)^3*B*a^5*b^5*c^2*d^8*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^3 + 840*I*(b*x*e + a*e)^3*B*a^6*b^4*c*d^9*g^2*e^4*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^3 - 120*I*(b*x*e + a*e)^3*B*a^7*b^3*d^10*g^2
*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 90*I*(b*x*e + a*e)
^4*B*b^9*c^7*d^4*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4
```

```
+ 630*I*(b*x*e + a*e)^4*B*a*b^8*c^6*d^5*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/
(d*x + c))/(d*x + c)^4 - 1890*I*(b*x*e + a*e)^4*B*a^2*b^7*c^5*d^6*g^2*e^3*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 3150*I*(b*x*e + a*e)^4*B
*a^3*b^6*c^4*d^7*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4
- 3150*I*(b*x*e + a*e)^4*B*a^4*b^5*c^3*d^8*g^2*e^3*log(-b*e + (b*x*e + a*e)
*d/(d*x + c))/(d*x + c)^4 + 1890*I*(b*x*e + a*e)^4*B*a^5*b^4*c^2*d^9*g^2*e^
3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 630*I*(b*x*e + a*e)^4
*B*a^6*b^3*c*d^10*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4
 + 90*I*(b*x*e + a*e)^4*B*a^7*b^2*d^11*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(
d*x + c))/(d*x + c)^4 + 36*I*(b*x*e + a*e)^5*B*b^8*c^7*d^5*g^2*e^2*log(-b*e
 + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 252*I*(b*x*e + a*e)^5*B*a*b^7*c
^6*d^6*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 756*I*(b
*x*e + a*e)^5*B*a^2*b^6*c^5*d^7*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c
))/(d*x + c)^5 - 1260*I*(b*x*e + a*e)^5*B*a^3*b^5*c^4*d^8*g^2*e^2*log(-b*e
+ (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 1260*I*(b*x*e + a*e)^5*B*a^4*b^4
*c^3*d^9*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 756*I*
(b*x*e + a*e)^5*B*a^5*b^3*c^2*d^10*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^5 + 252*I*(b*x*e + a*e)^5*B*a^6*b^2*c*d^11*g^2*e^2*log(-b*e
 + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 36*I*(b*x*e + a*e)^5*B*a^7*b*d^
12*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 6*I*(b*x*e +
 a*e)^6*B*b^7*c^7*d^6*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
^6 + 42*I*(b*x*e + a*e)^6*B*a*b^6*c^6*d^7*g^2*e*log(-b*e + (b*x*e + a*e)*d/
(d*x + c))/(d*x + c)^6 - 126*I*(b*x*e + a*e)^6*B*a^2*b^5*c^5*d^8*g^2*e*log(
-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^6 + 210*I*(b*x*e + a*e)^6*B*a^3
*b^4*c^4*d^9*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^6 - 210*
I*(b*x*e + a*e)^6*B*a^4*b^3*c^3*d^10*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^6 + 126*I*(b*x*e + a*e)^6*B*a^5...
```

Mupad [B]
time = 6.04, size = 2465, normalized size = 6.64

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^3*((g^2*i^3*(4*A*a^3*d^3 + 16*A*b^3*c^3 + B*a^3*d^3 - 3*B*b^3*c^3 + 72*A*
a*b^2*c^2*d + 48*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d + 5*B*a^2*b*c*d^2))/(12*b)
 + ((60*a*d + 60*b*c)*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d - B*b*
c))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d)
 - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2 - 3*B*b^2*c^2 + 60
*A*a*b*c*d + B*a*b*c*d))/5 + A*a*b*c*d^2*g^2*i^3))/(180*b*d) - (a*c*((b*d^2
*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d - B*b*c))/6 - (A*b*d^2*g^2*i^3*(60*a*
d + 60*b*c))/60))/(3*b*d)) - x^4*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B
*a*d - B*b*c))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c
```

))/(240*b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2 - 3*B*
b^2*c^2 + 60*A*a*b*c*d + B*a*b*c*d))/20 + (A*a*b*c*d^2*g^2*i^3)/4) + x^2*((
a*c*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d - B*b*c))/6 - (A*b*d^2*g
^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (d*g^2*i^3*(15*
A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2 - 3*B*b^2*c^2 + 60*A*a*b*c*d + B*a*b
*c*d))/5 + A*a*b*c*d^2*g^2*i^3))/(2*b*d) - ((60*a*d + 60*b*c)*((g^2*i^3*(4*
A*a^3*d^3 + 16*A*b^3*c^3 + B*a^3*d^3 - 3*B*b^3*c^3 + 72*A*a*b^2*c^2*d + 48*
A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d + 5*B*a^2*b*c*d^2))/(4*b) + ((60*a*d + 60*b
c)((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d - B*b*c))/6 - (A*b*d^2*g
^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (d*g^2*i^3*(15*
A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2 - 3*B*b^2*c^2 + 60*A*a*b*c*d + B*a*b
*c*d))/5 + A*a*b*c*d^2*g^2*i^3))/(60*b*d) - (a*c*((b*d^2*g^2*i^3*(18*A*a*d
+ 24*A*b*c + B*a*d - B*b*c))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60))/(
b*d)))/(120*b*d) + (c*g^2*i^3*(12*A*a^3*d^3 + 3*A*b^3*c^3 + 3*B*a^3*d^3 - B
*b^3*c^3 + 36*A*a*b^2*c^2*d + 54*A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d + 3*B*a^2*
b*c*d^2))/(6*b*d)) + log((e*(a + b*x))/(c + d*x))*(B*a^2*c^3*g^2*i^3*x + (B
*c*g^2*i^3*x^3*(3*a^2*d^2 + b^2*c^2 + 6*a*b*c*d))/3 + (B*d*g^2*i^3*x^4*(a^2
*d^2 + 3*b^2*c^2 + 6*a*b*c*d))/4 + (B*b^2*d^3*g^2*i^3*x^6)/6 + (B*a*c^2*g^2
*i^3*x^2*(3*a*d + 2*b*c))/2 + (B*b*d^2*g^2*i^3*x^5*(2*a*d + 3*b*c))/5) + x^
5*((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d - B*b*c))/30 - (A*b*d^2*g^2*
i^3*(60*a*d + 60*b*c))/300) - x*(((60*a*d + 60*b*c)*((a*c*((((b*d^2*g^2*i^3
*(18*A*a*d + 24*A*b*c + B*a*d - B*b*c))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b
c))/60)(60*a*d + 60*b*c))/(60*b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*
c^2 + 2*B*a^2*d^2 - 3*B*b^2*c^2 + 60*A*a*b*c*d + B*a*b*c*d))/5 + A*a*b*c*d^
2*g^2*i^3))/(b*d) - ((60*a*d + 60*b*c)*((g^2*i^3*(4*A*a^3*d^3 + 16*A*b^3*c^
3 + B*a^3*d^3 - 3*B*b^3*c^3 + 72*A*a*b^2*c^2*d + 48*A*a^2*b*c*d^2 - 3*B*a*b
^2*c^2*d + 5*B*a^2*b*c*d^2))/(4*b) + ((60*a*d + 60*b*c)*((((b*d^2*g^2*i^3*(
18*A*a*d + 24*A*b*c + B*a*d - B*b*c))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c
))/60)*(60*a*d + 60*b*c))/(60*b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^
2 + 2*B*a^2*d^2 - 3*B*b^2*c^2 + 60*A*a*b*c*d + B*a*b*c*d))/5 + A*a*b*c*d^2*
g^2*i^3))/(60*b*d) - (a*c*((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d - B*
b*c))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60))/(b*d)))/(60*b*d) + (c*g^
2*i^3*(12*A*a^3*d^3 + 3*A*b^3*c^3 + 3*B*a^3*d^3 - B*b^3*c^3 + 36*A*a*b^2*c^
2*d + 54*A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2))/(3*b*d)))/(60*
b*d) + (a*c*((g^2*i^3*(4*A*a^3*d^3 + 16*A*b^3*c^3 + B*a^3*d^3 - 3*B*b^3*c^3
 + 72*A*a*b^2*c^2*d + 48*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d + 5*B*a^2*b*c*d^2)
)/(4*b) + ((60*a*d + 60*b*c)*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d
 - B*b*c))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(
60*b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2 - 3*B*b^2*c
^2 + 60*A*a*b*c*d + B*a*b*c*d))/5 + A*a*b*c*d^2*g^2*i^3))/(60*b*d) - (a*c*(
(b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d - B*b*c))/6 - (A*b*d^2*g^2*i^3*
(60*a*d + 60*b*c))/60))/(b*d)))/(b*d) - (a*c^2*g^2*i^3*(12*A*a^2*d^2 + 6*A*
b^2*c^2 + 3*B*a^2*d^2 - 2*B*b^2*c^2 + 24*A*a*b*c*d - B*a*b*c*d))/(2*b*d)) -
 (log(c + d*x)*(B*b^2*c^6*g^2*i^3 + 15*B*a^2*c^4*d^2*g^2*i^3 - 6*B*a*b*c^5*
d*g^2*i^3))/(60*d^3) - (log(a + b*x)*(B*a^6*d^3*g^2*i^3 - 20*B*a^3*b^3*c^3*

```
g^2*i^3 - 6*B*a^5*b*c*d^2*g^2*i^3 + 15*B*a^4*b^2*c^2*d*g^2*i^3))/(60*b^4) +
 (A*b^2*d^3*g^2*i^3*x^6)/6
```

3.22 $\int (ag+bgx)(ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=271

$$\frac{B(bc-ad)^4gi^3x}{20b^3d}+\frac{B(bc-ad)^3gi^3(c+dx)^2}{40b^2d^2}+\frac{B(bc-ad)^2gi^3(c+dx)^3}{60bd^2}-\frac{B(bc-ad)gi^3(c+dx)^4}{20d^2}+\frac{B(bc-ad)}{2}$$

```
[Out] 1/20*B*(-a*d+b*c)^4*g*i^3*x/b^3/d+1/40*B*(-a*d+b*c)^3*g*i^3*(d*x+c)^2/b^2/d
^2+1/60*B*(-a*d+b*c)^2*g*i^3*(d*x+c)^3/b/d^2-1/20*B*(-a*d+b*c)*g*i^3*(d*x+c
)^4/d^2+1/20*B*(-a*d+b*c)^5*g*i^3*ln((b*x+a)/(d*x+c))/b^4/d^2-1/4*(-a*d+b*c
)*g*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^2+1/5*b*g*i^3*(d*x+c)^5*(A+
B*ln(e*(b*x+a)/(d*x+c)))/d^2+1/20*B*(-a*d+b*c)^5*g*i^3*ln(d*x+c)/b^4/d^2
```

Rubi [A]

time = 0.17, antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.132$, Rules used = {2562, 45, 2382, 12, 78}

$$-\frac{gi^3(c+dx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^2}+\frac{bgi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^2}+\frac{Bgi^3(bc-ad)^5\log\left(\frac{a+bx}{c+dx}\right)}{20b^4d^2}+\frac{Bgi^3(bc-ad)^5\log(c+dx)}{20b^4d^2}+\frac{Bgi^3x(bc-ad)^4}{20b^3d}+\frac{Bgi^3(c+dx)^2(bc-ad)^3}{40b^2d^2}+\frac{Bgi^3(c+dx)^3(bc-ad)^2}{60bd^2}-\frac{Bgi^3(c+dx)^4(bc-ad)}{20d^2}$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 45

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

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
```

```
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (22c+22dx)^3(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx = \int \left(\frac{(-bc+ad)g(22c+22dx)^3\left(A+B\log\left(\frac{e\ldots}{}\right.\right.}{d}\right.$$

$$= \frac{(bg)\int(22c+22dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx\ldots}{22d}$$

$$= -\frac{2662(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx\ldots}{c+dx}\right.\right.}{d^2}$$

$$= -\frac{2662(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx\ldots}{c+dx}\right.\right.}{d^2}$$

$$= -\frac{2662(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx\ldots}{c+dx}\right.\right.}{d^2}$$

$$= \frac{2662B(bc-ad)^4gx}{5b^3d} + \frac{1331B(bc-ad)^3g(c+\ldots}{5b^2d^2}$$

Mathematica [A]

time = 0.14, size = 261, normalized size = 0.96

$$\frac{gi^3\left(\frac{5B(bc-ad)^2(6bd(bc-ad)^2x+3b^2(bc-ad)(c+dx)^2+2b^3(c+dx)^3+6(bc-ad)^3\log(a+bx))}{b^4}-\frac{2B(bc-ad)(12bd(bc-ad)^3x+6b^2(bc-ad)^2(c+dx)^2+4b^3(bc-ad)(c+dx)^3+3b^4(c+dx)^4+12(bc-ad)^4\log(a+bx))}{b^4}-30(bc-ad)(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+24b(c+dx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\right)}{120d^2}$$

Antiderivative was successfully verified.

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

```
[Out] (g*i^3*((5*B*(b*c - a*d)^2*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c +
d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/b^4 - (2*B*(b*c
 - a*d)*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b^3*(
b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b*x])
)/b^4 - 30*(b*c - a*d)*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2
4*b*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(120*d^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 6451 vs. 2(255) = 510.
time = 0.60, size = 6452, normalized size = 23.81

method	result
risch	$\frac{i^3 g\, d^2 B \ln(bx+a) a^4 c}{4b^3} - \frac{i^3 g d B \ln(bx+a) a^3 c^2}{2b^2} + \frac{3 i^3 g d A a\, c^2 x^2}{2} + \frac{i^3 g\, d^2 B\, a^2 c\, x^2}{8b} + \frac{i^3 g d B a\, c^2 x^2}{8} + i^3 g A a\, c^3 x -$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 994 vs. 2(233) = 466.
time = 0.31, size = 994, normalized size = 3.67

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 486 vs. $2(233) = 466$.
time = 0.45, size = 486, normalized size = 1.79

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1158 vs. $2(252) = 504$.
time = 4.59, size = 1158, normalized size = 4.27

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*b*d**3*g*i**3*x**5/5 - B*a**2*g*i**3*(a**3*d**3 - 5*a**2*b*c*d**2 + 10*a*
b**2*c**2*d - 10*b**3*c**3)*log(x + (B*a**5*c*d**4*g*i**3 - 5*B*a**4*b*c**2
*d**3*g*i**3 + 10*B*a**3*b**2*c**3*d**2*g*i**3 + B*a**3*d**2*g*i**3*(a**3*d
**3 - 5*a**2*b*c*d**2 + 10*a*b**2*c**2*d - 10*b**3*c**3)/b - 15*B*a**2*b**3
*c**4*d*g*i**3 - B*a**2*c*d*g*i**3*(a**3*d**3 - 5*a**2*b*c*d**2 + 10*a*b**2
*c**2*d - 10*b**3*c**3) + B*a*b**4*c**5*g*i**3)/(B*a**5*d**5*g*i**3 - 5*B*a
**4*b*c*d**4*g*i**3 + 10*B*a**3*b**2*c**2*d**3*g*i**3 - 10*B*a**2*b**3*c**3
*d**2*g*i**3 - 5*B*a*b**4*c**4*d*g*i**3 + B*b**5*c**5*g*i**3))/(20*b**4) -
B*c**4*g*i**3*(5*a*d - b*c)*log(x + (B*a**5*c*d**4*g*i**3 - 5*B*a**4*b*c**2
*d**3*g*i**3 + 10*B*a**3*b**2*c**3*d**2*g*i**3 - 15*B*a**2*b**3*c**4*d*g*i*
*3 + B*a*b**4*c**5*g*i**3 + B*a*b**3*c**4*g*i**3*(5*a*d - b*c) - B*b**4*c**
5*g*i**3*(5*a*d - b*c)/d)/(B*a**5*d**5*g*i**3 - 5*B*a**4*b*c*d**4*g*i**3 +
10*B*a**3*b**2*c**2*d**3*g*i**3 - 10*B*a**2*b**3*c**3*d**2*g*i**3 - 5*B*a*b
**4*c**4*d*g*i**3 + B*b**5*c**5*g*i**3))/(20*d**2) + x**4*(A*a*d**3*g*i**3/
4 + 3*A*b*c*d**2*g*i**3/4 + B*a*d**3*g*i**3/20 - B*b*c*d**2*g*i**3/20) + x*
*3*(A*a*c*d**2*g*i**3 + A*b*c**2*d*g*i**3 + B*a**2*d**3*g*i**3/(60*b) + B*a
*c*d**2*g*i**3/6 - 11*B*b*c**2*d*g*i**3/60) + x**2*(3*A*a*c**2*d*g*i**3/2 +
 A*b*c**3*g*i**3/2 - B*a**3*d**3*g*i**3/(40*b**2) + B*a**2*c*d**2*g*i**3/(8
*b) + B*a*c**2*d*g*i**3/8 - 9*B*b*c**3*g*i**3/40) + x*(A*a*c**3*g*i**3 + B*
a**4*d**3*g*i**3/(20*b**3) - B*a**3*c*d**2*g*i**3/(4*b**2) + B*a**2*c**2*d*
g*i**3/(2*b) - B*a*c**3*g*i**3/4 - B*b*c**4*g*i**3/(20*d)) + (B*a*c**3*g*i*
*3*x + 3*B*a*c**2*d*g*i**3*x**2/2 + B*a*c*d**2*g*i**3*x**3 + B*a*d**3*g*i**
3*x**4/4 + B*b*c**3*g*i**3*x**2/2 + B*b*c**2*d*g*i**3*x**3 + 3*B*b*c*d**2*g
*i**3*x**4/4 + B*b*d**3*g*i**3*x**5/5)*log(e*(a + b*x)/(c + d*x))
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5591 vs. 2(233) = 466.
time = 4.16, size = 5591, normalized size = 20.63

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/120*(6*I*B*b^11*c^6*g*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 36*I*B*
a*b^10*c^5*d*g*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 90*I*B*a^2*b^9*c
^4*d^2*g*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 120*I*B*a^3*b^8*c^3*d^
3*g*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 90*I*B*a^4*b^7*c^2*d^4*g*e^
6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 36*I*B*a^5*b^6*c*d^5*g*e^6*log(-b
*e + (b*x*e + a*e)*d/(d*x + c)) + 6*I*B*a^6*b^5*d^6*g*e^6*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c)) - 30*I*(b*x*e + a*e)*B*b^10*c^6*d*g*e^5*log(-b*e + (b*
x*e + a*e)*d/(d*x + c))/(d*x + c) + 180*I*(b*x*e + a*e)*B*a*b^9*c^5*d^2*g*e
^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 450*I*(b*x*e + a*e)*B*
```

a^2*b^8*c^4*d^3*g*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 600
I(b*x*e + a*e)*B*a^3*b^7*c^3*d^4*g*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x +
c))/(d*x + c) - 450*I*(b*x*e + a*e)*B*a^4*b^6*c^2*d^5*g*e^5*log(-b*e + (b*x
*e + a*e)*d/(d*x + c))/(d*x + c) + 180*I*(b*x*e + a*e)*B*a^5*b^5*c*d^6*g*e^
5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 30*I*(b*x*e + a*e)*B*a^
6*b^4*d^7*g*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 60*I*(b*x
*e + a*e)^2*B*b^9*c^6*d^2*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
+ c)^2 - 360*I*(b*x*e + a*e)^2*B*a*b^8*c^5*d^3*g*e^4*log(-b*e + (b*x*e + a*
e)*d/(d*x + c))/(d*x + c)^2 + 900*I*(b*x*e + a*e)^2*B*a^2*b^7*c^4*d^4*g*e^4
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 1200*I*(b*x*e + a*e)^2
*B*a^3*b^6*c^3*d^5*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2
+ 900*I*(b*x*e + a*e)^2*B*a^4*b^5*c^2*d^6*g*e^4*log(-b*e + (b*x*e + a*e)*d/
(d*x + c))/(d*x + c)^2 - 360*I*(b*x*e + a*e)^2*B*a^5*b^4*c*d^7*g*e^4*log(-b
*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 60*I*(b*x*e + a*e)^2*B*a^6*b^
3*d^8*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 60*I*(b*x*e
 + a*e)^3*B*b^8*c^6*d^3*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x +
c)^3 + 360*I*(b*x*e + a*e)^3*B*a*b^7*c^5*d^4*g*e^3*log(-b*e + (b*x*e + a*e)
*d/(d*x + c))/(d*x + c)^3 - 900*I*(b*x*e + a*e)^3*B*a^2*b^6*c^4*d^5*g*e^3*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 1200*I*(b*x*e + a*e)^3*B
*a^3*b^5*c^3*d^6*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 -
900*I*(b*x*e + a*e)^3*B*a^4*b^4*c^2*d^7*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d
*x + c))/(d*x + c)^3 + 360*I*(b*x*e + a*e)^3*B*a^5*b^3*c*d^8*g*e^3*log(-b*e
 + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 60*I*(b*x*e + a*e)^3*B*a^6*b^2*
d^9*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 30*I*(b*x*e +
 a*e)^4*B*b^7*c^6*d^4*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
^4 - 180*I*(b*x*e + a*e)^4*B*a*b^6*c^5*d^5*g*e^2*log(-b*e + (b*x*e + a*e)*d
/(d*x + c))/(d*x + c)^4 + 450*I*(b*x*e + a*e)^4*B*a^2*b^5*c^4*d^6*g*e^2*log
(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 600*I*(b*x*e + a*e)^4*B*a^
3*b^4*c^3*d^7*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 450
I(b*x*e + a*e)^4*B*a^4*b^3*c^2*d^8*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^4 - 180*I*(b*x*e + a*e)^4*B*a^5*b^2*c*d^9*g*e^2*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 30*I*(b*x*e + a*e)^4*B*a^6*b*d^10*
g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 6*I*(b*x*e + a*e)
^5*B*b^6*c^6*d^5*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 36
I(b*x*e + a*e)^5*B*a*b^5*c^5*d^6*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c)
)/(d*x + c)^5 - 90*I*(b*x*e + a*e)^5*B*a^2*b^4*c^4*d^7*g*e*log(-b*e + (b*x*
e + a*e)*d/(d*x + c))/(d*x + c)^5 + 120*I*(b*x*e + a*e)^5*B*a^3*b^3*c^3*d^8
*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 90*I*(b*x*e + a*e)
^5*B*a^4*b^2*c^2*d^9*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5
+ 36*I*(b*x*e + a*e)^5*B*a^5*b*c*d^10*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x +
 c))/(d*x + c)^5 - 6*I*(b*x*e + a*e)^5*B*a^6*d^11*g*e*log(-b*e + (b*x*e + a
*e)*d/(d*x + c))/(d*x + c)^5 - 60*I*(b*x*e + a*e)^2*B*b^9*c^6*d^2*g*e^4*log
((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 360*I*(b*x*e + a*e)^2*B*a*b^8*c^5*d
^3*g*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 900*I*(b*x*e + a*e)^2*B
*a^2*b^7*c^4*d^4*g*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 1200*I*(b

```
*x*e + a*e)^2*B*a^3*b^6*c^3*d^5*g*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c
)^2 - 900*I*(b*x*e + a*e)^2*B*a^4*b^5*c^2*d^6*g*e^4*log((b*x*e + a*e)/(d*x
+ c))/(d*x + c)^2 + 360*I*(b*x*e + a*e)^2*B*a^5*b^4*c*d^7*g*e^4*log((b*x*e
+ a*e)/(d*x + c))/(d*x + c)^2 - 60*I*(b*x*e + a*e)^2*B*a^6*b^3*d^8*g*e^4*lo
g((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 60*I*(b*x*e + a*e)^3*B*b^8*c^6*d^3
*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 360*I*(b*x*e + a*e)^3*B*a
*b^7*c^5*d^4*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 900*I*(b*x*e
+ a*e)^3*B*a^2*b^6*c^4*d^5*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 -
 1200*I*(b*x*e + a*e)^3*B*a^3*b^5*c^3*d^6*g*e^3*log((b*x*e + a*e)/(d*x + c)
)/(d*x + c)^3 + 900*I*(b*x*e + a*e)^3*B*a^4*b^4*c^2*d^7*g*e^3*log((b*x*e +
a*e)/(d*x + c))/(d*x + c)^3 - 360*I*(b*x*e + a*e)^3*B*a^5*b^3*c*d^8*g*e^3*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 60*I*(b*x*e + a*e)^3*B*a^6*b^2*d^
9*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^...
```

Mupad [B]
time = 5.44, size = 1192, normalized size = 4.40

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^4*((d^2*g*i^3*(10*A*a*d + 20*A*b*c + B*a*d - B*b*c))/20 - (A*d^2*g*i^3*(2
0*a*d + 20*b*c))/80) + x*((a*c*(((20*a*d + 20*b*c)*((d^2*g*i^3*(10*A*a*d +
20*A*b*c + B*a*d - B*b*c))/5 - (A*d^2*g*i^3*(20*a*d + 20*b*c))/20))/(20*b*d
) - (d*g*i^3*(4*A*a^2*d^2 + 24*A*b^2*c^2 + B*a^2*d^2 - 3*B*b^2*c^2 + 32*A*a
*b*c*d + 2*B*a*b*c*d))/(4*b) + A*a*c*d^2*g*i^3))/(b*d) - ((20*a*d + 20*b*c)
*(((20*a*d + 20*b*c)*(((20*a*d + 20*b*c)*((d^2*g*i^3*(10*A*a*d + 20*A*b*c +
 B*a*d - B*b*c))/5 - (A*d^2*g*i^3*(20*a*d + 20*b*c))/20))/(20*b*d) - (d*g*i
^3*(4*A*a^2*d^2 + 24*A*b^2*c^2 + B*a^2*d^2 - 3*B*b^2*c^2 + 32*A*a*b*c*d + 2
*B*a*b*c*d))/(4*b) + A*a*c*d^2*g*i^3))/(20*b*d) - (a*c*((d^2*g*i^3*(10*A*a*
d + 20*A*b*c + B*a*d - B*b*c))/5 - (A*d^2*g*i^3*(20*a*d + 20*b*c))/20))/(b*
d) + (c*g*i^3*(4*A*a^2*d^2 + 4*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^2 + 12*A*a*b
*c*d))/b))/(20*b*d) + (c^2*g*i^3*(12*A*a^2*d^2 + 2*A*b^2*c^2 + 3*B*a^2*d^2
- B*b^2*c^2 + 16*A*a*b*c*d - 2*B*a*b*c*d))/(2*b*d)) - x^3*(((20*a*d + 20*b*
c)*((d^2*g*i^3*(10*A*a*d + 20*A*b*c + B*a*d - B*b*c))/5 - (A*d^2*g*i^3*(20*
a*d + 20*b*c))/20))/(60*b*d) - (d*g*i^3*(4*A*a^2*d^2 + 24*A*b^2*c^2 + B*a^2
*d^2 - 3*B*b^2*c^2 + 32*A*a*b*c*d + 2*B*a*b*c*d))/(12*b) + (A*a*c*d^2*g*i^3
)/3) + x^2*(((20*a*d + 20*b*c)*(((20*a*d + 20*b*c)*((d^2*g*i^3*(10*A*a*d +
20*A*b*c + B*a*d - B*b*c))/5 - (A*d^2*g*i^3*(20*a*d + 20*b*c))/20))/(20*b*d
) - (d*g*i^3*(4*A*a^2*d^2 + 24*A*b^2*c^2 + B*a^2*d^2 - 3*B*b^2*c^2 + 32*A*a
*b*c*d + 2*B*a*b*c*d))/(4*b) + A*a*c*d^2*g*i^3))/(40*b*d) - (a*c*((d^2*g*i^
3*(10*A*a*d + 20*A*b*c + B*a*d - B*b*c))/5 - (A*d^2*g*i^3*(20*a*d + 20*b*c)
)/20))/(2*b*d) + (c*g*i^3*(4*A*a^2*d^2 + 4*A*b^2*c^2 + B*a^2*d^2 - B*b^2*c^
2 + 12*A*a*b*c*d))/(2*b)) + log((e*(a + b*x))/(c + d*x))*((B*c^2*g*i^3*x^2*
```

```
(3*a*d + b*c))/2 + (B*d^2*g*i^3*x^4*(a*d + 3*b*c))/4 + B*a*c^3*g*i^3*x + (B
*b*d^3*g*i^3*x^5)/5 + B*c*d*g*i^3*x^3*(a*d + b*c)) + (log(c + d*x)*(B*b*c^5
*g*i^3 - 5*B*a*c^4*d*g*i^3))/(20*d^2) - (log(a + b*x)*(B*a^5*d^3*g*i^3 - 10
*B*a^2*b^3*c^3*g*i^3 - 5*B*a^4*b*c*d^2*g*i^3 + 10*B*a^3*b^2*c^2*d*g*i^3))/(
20*b^4) + (A*b*d^3*g*i^3*x^5)/5
```

3.23 $\int (ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=149

$$-\frac{B(bc-ad)^3 i^3 x}{4b^3}-\frac{B(bc-ad)^2 i^3 (c+dx)^2}{8b^2 d}-\frac{B(bc-ad) i^3 (c+dx)^3}{12bd}-\frac{B(bc-ad)^4 i^3 \log(a+bx)}{4b^4 d}+\frac{i^3(c+dx)^4}{}$$

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

Rubi [A]
time = 0.07, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2548, 21, 45}

$$\frac{i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d}-\frac{Bi^3(bc-ad)^4\log(a+bx)}{4b^4d}-\frac{Bi^3x(bc-ad)^3}{4b^3}-\frac{Bi^3(c+dx)^2(bc-ad)^2}{8b^2d}-\frac{Bi^3(c+dx)^3(bc-ad)}{12bd}$$

Antiderivative was successfully verified.

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

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

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

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

Rule 2548

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*(
(A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*(m + 1))), x] - Dist[B*n*((b*c
```

```
- a*d)/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /;
 FreeQ[{a, b, c, d, e, f, g, A, B, m, n}, x] && EqQ[n + mn, 0] && NeQ[b*c -
 a*d, 0] && NeQ[m, -1] &&  !(EqQ[m, -2] && IntegerQ[n])
```

Rubi steps

$$\int (23c+23dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \frac{12167(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4d} - \frac{B\int \frac{279841(bc-ad}{a+bx}}{92d}$$
$$= \frac{12167(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4d} - \frac{(12167B(bc-}{4}$$
$$= \frac{12167(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4d} - \frac{(12167B(bc-}{}$$
$$= -\frac{12167B(bc-ad)^3x}{4b^3} - \frac{12167B(bc-ad)^2(c+dx)^2}{8b^2d} - 1$$

Mathematica [A]
time = 0.04, size = 120, normalized size = 0.81

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

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
[Out] (i^3*(-1/6*(B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d
*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/b^4 + (c + d*x)^
4*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(4*d)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 2665 vs. $2(139) = 278$.
time = 0.54, size = 2666, normalized size = 17.89

method	result
risch	$\frac{i^3(dx+c)^4B\ln\left(\frac{e(bx+a)}{dx+c}\right)}{4d}+\frac{i^3d^3Ax^4}{4}+i^3d^2Acx^3+\frac{i^3d^3Bax^3}{12b}-\frac{i^3d^2Bcx^3}{12}+\frac{3i^3dAc^2x^2}{2}-\frac{i^3d^3Ba^2x^2}{8b^2}$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/d^2*e*(a*d-b*c)*(-3/8*B*d^3*e*i^3/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d
)^2*a^2*c-B*d^7*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^3/b^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^3+3/4*B*d^3/e*i^3/b^
3*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^2*c-3/4*B*d^2/e*i^3/b^2*ln(b*e-
(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a*c^2+1/4*B*d^2*e^2*i^3*b/(b*e-(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*d)^3*a*c^2-3/4*B*d^7/e*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4/b^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d
)^4*a^2*c-9/2*B*d^5*e*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^2/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^2*c+3/4*B*d^6/e*
i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4/b^2/(b*
e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a*c^2-3*B*d^3*e^2*i^3*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(b*e-(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*d)^4*a*c^2-1/4*B*d*i^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*c^3-1/
12*B*d*e^2*i^3*b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*c^3+1/12*B*d^4*e
^2*i^3/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^3-1/8*B*d*e*i^3*b/(b*e-(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*c^3+3/4*B*d^2*i^3/b/(b*e-(b*e/d+(a*d-b*c)
*e/d/(d*x+c))*d)*a*c^2+3/8*B*d^2*e*i^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d
)^2*a*c^2-1/4*B*d^3*e^2*i^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^2*c+1
/4*B*d/e*i^3/b*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*c^3+1/8*B*d^4*e*i^3/
b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a^3+3/2*B*d^6*e*i^3*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/b^2/(b*e-(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*d)^4*a^3-1/4*B*d^5/e*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^4/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*c^
3+B*d^2*e^2*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*c^3-3/2*B*d^3*e*i^3*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b/(b*e-(b*e/d+(a*d-
b*c)*e/d/(d*x+c))*d)^4*c^3+1/4*B*d^8/e*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4/b^4/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4
*a^3-B*d^5*e^2*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^3-3*B*d^5*i^3*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/b/(b*e-(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*d)^4*a*c^2+3*B*d^4*e^2*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^2*c+
3*B*d^6*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3
/b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*a^2*c+9/2*B*d^4*e*i^3*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*d)^4*a*c^2-1/4*B*d^4/e*i^3/b^4*ln(b*e-(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*d)*a^3+B*d^4*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4*c^3-3/4*B*d^3*i^3/b^
2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^2*c-1/4*A*d*e^3*i^3*(a^3*d^3-3*a^
2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^4+1/
4*B*d^4*i^3/b^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^3)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger

than twice the leaf count of optimal. 426 vs. $2(125) = 250$.
time = 0.29, size = 426, normalized size = 2.86

$$-\frac{1}{4}i\,Ad^{3}x^{4}-i\,Acd^{2}x^{3}-\frac{3}{2}i\,Ac^{2}dx^{2}-i\left(x\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log\left(bx+a\right)}{b}-\frac{c\log\left(dx+c\right)}{d}\right)Bc^{3}-\frac{3}{2}i\left(x^{2}\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)-\frac{a^{2}\log\left(bx+a\right)}{b^{2}}+\frac{c^{2}\log\left(dx+c\right)}{d^{2}}-\frac{(bc-ad)x}{bd}\right)Bc^{2}d-\frac{1}{2}i\left(2\,x^{3}\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)+\frac{2\,a^{3}\log\left(bx+a\right)}{b^{3}}-\frac{2\,c^{3}\log\left(dx+c\right)}{d^{3}}-\frac{(b^{2}cd-abd^{2})x^{2}-2\,(b^{2}c^{2}-a^{2}d^{2})x}{b^{2}d^{2}}\right)Bcd^{2}-\frac{1}{24}i\left(6\,x^{4}\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)-\frac{6\,a^{4}\log\left(bx+a\right)}{b^{4}}+\frac{6\,c^{4}\log\left(dx+c\right)}{d^{4}}-\frac{2\,(b^{3}cd^{2}-ab^{2}d^{3})x^{3}-3\,(b^{3}c^{2}d-a^{2}bd^{3})x^{2}+6\,(b^{3}c^{3}-a^{3}d^{3})x}{b^{3}d^{3}}\right)Bd^{3}-i\,Ac^{3}x$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 302 vs. $2(125) = 250$.
time = 0.43, size = 302, normalized size = 2.03

$$\frac{-6i\,Ab^{4}d^{4}x^{4}+6i\,Bb^{4}c^{4}\log\left(\frac{dx+c}{d}\right)-2\left((12i\,A-i\,B)b^{4}cd^{3}+i\,Bab^{3}d^{4}\right)x^{3}-3\left(3\,(4i\,A-i\,B)b^{4}c^{2}d^{2}+4i\,Bab^{3}cd^{3}-i\,Ba^{2}b^{2}d^{4}\right)x^{2}-6\left((4i\,A-3i\,B)b^{4}c^{3}d+6i\,Bab^{3}c^{2}d^{2}-4i\,Ba^{2}b^{2}cd^{3}+i\,Ba^{3}bd^{4}\right)x-6\left(i\,Bb^{4}d^{4}x^{4}+4i\,Bb^{4}cd^{3}x^{3}+6i\,Bb^{4}c^{2}d^{2}x^{2}+4i\,Bb^{4}c^{3}dx\right)\log\left(\frac{(bx+a)e}{dx+c}\right)-6\left(4i\,Bab^{3}c^{3}d-6i\,Ba^{2}b^{2}c^{2}d^{2}+4i\,Ba^{3}bcd^{3}-i\,Ba^{4}d^{4}\right)\log\left(\frac{bx+a}{b}\right)}{24\,b^{4}d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 706 vs. $2(128) = 256$.
time = 2.42, size = 706, normalized size = 4.74

$$\frac{Ad^{3}i^{3}x^{4}}{4}-\frac{Bai^{3}(ad-2bc)\left(a^{2}d^{2}-2abcd+2b^{2}c^{2}\right)\log\left(x+\frac{Ba^{4}cd^{3}i^{3}-4Ba^{3}bc^{2}d^{2}i^{3}+6Ba^{2}b^{2}c^{3}di^{3}+\frac{Ba^{2}di^{3}(ad-2bc)\left(a^{2}d^{2}-2abcd+2b^{2}c^{2}\right)}{b}-5Bab^{3}c^{4}i^{3}-Baci^{3}(ad-2bc)\left(a^{2}d^{2}-2abcd+2b^{2}c^{2}\right)}{Ba^{4}d^{4}i^{3}-4Ba^{3}bcd^{3}i^{3}+6Ba^{2}b^{2}c^{2}d^{2}i^{3}-4Bab^{3}c^{3}di^{3}-Bb^{4}c^{4}i^{3}}\right)}{4b^{4}}-\frac{Bc^{4}i^{3}\log\left(x+\frac{Ba^{4}cd^{3}i^{3}-4Ba^{3}bc^{2}d^{2}i^{3}+6Ba^{2}b^{2}c^{3}di^{3}-4Bab^{3}c^{4}i^{3}-\frac{Bb^{4}c^{5}i^{3}}{d}}{Ba^{4}d^{4}i^{3}-4Ba^{3}bcd^{3}i^{3}+6Ba^{2}b^{2}c^{2}d^{2}i^{3}-4Bab^{3}c^{3}di^{3}-Bb^{4}c^{4}i^{3}}\right)}{4d}+x^{3}\left(Acd^{2}i^{3}+\frac{Bad^{3}i^{3}}{12b}-\frac{Bcd^{2}i^{3}}{12}\right)+x^{2}\cdot\left(\frac{3Ac^{2}di^{3}}{2}-\frac{Ba^{2}d^{3}i^{3}}{8b^{2}}+\frac{Bacd^{2}i^{3}}{2b}-\frac{3Bc^{2}di^{3}}{8}\right)+x\left(Ac^{3}i^{3}+\frac{Ba^{3}d^{3}i^{3}}{4b^{3}}-\frac{Ba^{2}cd^{2}i^{3}}{b^{2}}+\frac{3Bac^{2}di^{3}}{2b}-\frac{3Bc^{3}i^{3}}{4}\right)+\left(Bc^{3}i^{3}x+\frac{3Bc^{2}di^{3}x^{2}}{2}+Bcd^{2}i^{3}x^{3}+\frac{Bd^{3}i^{3}x^{4}}{4}\right)\log\left(\frac{e(a+bx)}{c+dx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
**2*c**3*d*i**3 + B*a**2*d*i**3*(a*d - 2*b*c)*(a**2*d**2 - 2*a*b*c*d + 2*b*
*2*c**2)/b - 5*B*a*b**3*c**4*i**3 - B*a*c*i**3*(a*d - 2*b*c)*(a**2*d**2 - 2
*a*b*c*d + 2*b**2*c**2))/(B*a**4*d**4*i**3 - 4*B*a**3*b*c*d**3*i**3 + 6*B*a
**2*b**2*c**2*d**2*i**3 - 4*B*a*b**3*c**3*d*i**3 - B*b**4*c**4*i**3))/(4*b*
*4) - B*c**4*i**3*log(x + (B*a**4*c*d**3*i**3 - 4*B*a**3*b*c**2*d**2*i**3 +
 6*B*a**2*b**2*c**3*d*i**3 - 4*B*a*b**3*c**4*i**3 - B*b**4*c**5*i**3/d)/(B*
a**4*d**4*i**3 - 4*B*a**3*b*c*d**3*i**3 + 6*B*a**2*b**2*c**2*d**2*i**3 - 4*
B*a*b**3*c**3*d*i**3 - B*b**4*c**4*i**3))/(4*d) + x**3*(A*c*d**2*i**3 + B*a
*d**3*i**3/(12*b) - B*c*d**2*i**3/12) + x**2*(3*A*c**2*d*i**3/2 - B*a**2*d*
*3*i**3/(8*b**2) + B*a*c*d**2*i**3/(2*b) - 3*B*c**2*d*i**3/8) + x*(A*c**3*i
**3 + B*a**3*d**3*i**3/(4*b**3) - B*a**2*c*d**2*i**3/b**2 + 3*B*a*c**2*d*i*
*3/(2*b) - 3*B*c**3*i**3/4) + (B*c**3*i**3*x + 3*B*c**2*d*i**3*x**2/2 + B*c
*d**2*i**3*x**3 + B*d**3*i**3*x**4/4)*log(e*(a + b*x)/(c + d*x))
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3885 vs. $2(125) = 250$.
time = 4.34, size = 3885, normalized size = 26.07

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(-6*I*B*b^9*c^5*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 30*I*B*a*b
^8*c^4*d*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 60*I*B*a^2*b^7*c^3*d^2
*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 60*I*B*a^3*b^6*c^2*d^3*e^5*log
(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 30*I*B*a^4*b^5*c*d^4*e^5*log(-b*e + (b
*x*e + a*e)*d/(d*x + c)) + 6*I*B*a^5*b^4*d^5*e^5*log(-b*e + (b*x*e + a*e)*d
/(d*x + c)) + 24*I*(b*x*e + a*e)*B*b^8*c^5*d*e^4*log(-b*e + (b*x*e + a*e)*d
/(d*x + c))/(d*x + c) - 120*I*(b*x*e + a*e)*B*a*b^7*c^4*d^2*e^4*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 240*I*(b*x*e + a*e)*B*a^2*b^6*c^3*d^
3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 240*I*(b*x*e + a*e)
*B*a^3*b^5*c^2*d^4*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 12
0*I*(b*x*e + a*e)*B*a^4*b^4*c*d^5*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))
/(d*x + c) - 24*I*(b*x*e + a*e)*B*a^5*b^3*d^6*e^4*log(-b*e + (b*x*e + a*e)*
d/(d*x + c))/(d*x + c) - 36*I*(b*x*e + a*e)^2*B*b^7*c^5*d^2*e^3*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 180*I*(b*x*e + a*e)^2*B*a*b^6*c^4*
d^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 360*I*(b*x*e +
a*e)^2*B*a^2*b^5*c^3*d^4*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c
)^2 + 360*I*(b*x*e + a*e)^2*B*a^3*b^4*c^2*d^5*e^3*log(-b*e + (b*x*e + a*e)*
d/(d*x + c))/(d*x + c)^2 - 180*I*(b*x*e + a*e)^2*B*a^4*b^3*c*d^6*e^3*log(-b
*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 36*I*(b*x*e + a*e)^2*B*a^5*b^
2*d^7*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 24*I*(b*x*e +
 a*e)^3*B*b^6*c^5*d^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3
 - 120*I*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*e^2*log(-b*e + (b*x*e + a*e)*d/(d*
```

```
x + c))/(d*x + c)^3 + 240*I*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*e^2*log(-b*e
+ (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 240*I*(b*x*e + a*e)^3*B*a^3*b^3*
c^2*d^6*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 120*I*(b*x*
e + a*e)^3*B*a^4*b^2*c*d^7*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x +
 c)^3 - 24*I*(b*x*e + a*e)^3*B*a^5*b*d^8*e^2*log(-b*e + (b*x*e + a*e)*d/(d*
x + c))/(d*x + c)^3 - 6*I*(b*x*e + a*e)^4*B*b^5*c^5*d^4*e*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^4 + 30*I*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*e*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 60*I*(b*x*e + a*e)^4*B*a
^2*b^3*c^3*d^6*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 60*I*(
b*x*e + a*e)^4*B*a^3*b^2*c^2*d^7*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^4 - 30*I*(b*x*e + a*e)^4*B*a^4*b*c*d^8*e*log(-b*e + (b*x*e + a*e)*d
/(d*x + c))/(d*x + c)^4 + 6*I*(b*x*e + a*e)^4*B*a^5*d^9*e*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^4 - 24*I*(b*x*e + a*e)*B*b^8*c^5*d*e^4*log((
b*x*e + a*e)/(d*x + c))/(d*x + c) + 120*I*(b*x*e + a*e)*B*a*b^7*c^4*d^2*e^4
*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 240*I*(b*x*e + a*e)*B*a^2*b^6*c^3
*d^3*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 240*I*(b*x*e + a*e)*B*a^3
*b^5*c^2*d^4*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 120*I*(b*x*e + a*
e)*B*a^4*b^4*c*d^5*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 24*I*(b*x*e
 + a*e)*B*a^5*b^3*d^6*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 36*I*(b*
x*e + a*e)^2*B*b^7*c^5*d^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 1
80*I*(b*x*e + a*e)^2*B*a*b^6*c^4*d^3*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x
+ c)^2 + 360*I*(b*x*e + a*e)^2*B*a^2*b^5*c^3*d^4*e^3*log((b*x*e + a*e)/(d*x
 + c))/(d*x + c)^2 - 360*I*(b*x*e + a*e)^2*B*a^3*b^4*c^2*d^5*e^3*log((b*x*e
 + a*e)/(d*x + c))/(d*x + c)^2 + 180*I*(b*x*e + a*e)^2*B*a^4*b^3*c*d^6*e^3*
log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 36*I*(b*x*e + a*e)^2*B*a^5*b^2*d
^7*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 24*I*(b*x*e + a*e)^3*B*b^
6*c^5*d^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 120*I*(b*x*e + a*e
)^3*B*a*b^5*c^4*d^4*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 240*I*(b
*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^
3 + 240*I*(b*x*e + a*e)^3*B*a^3*b^3*c^2*d^6*e^2*log((b*x*e + a*e)/(d*x + c)
)/(d*x + c)^3 - 120*I*(b*x*e + a*e)^3*B*a^4*b^2*c*d^7*e^2*log((b*x*e + a*e)
/(d*x + c))/(d*x + c)^3 + 24*I*(b*x*e + a*e)^3*B*a^5*b*d^8*e^2*log((b*x*e +
 a*e)/(d*x + c))/(d*x + c)^3 + 6*I*(b*x*e + a*e)^4*B*b^5*c^5*d^4*e*log((b*x
*e + a*e)/(d*x + c))/(d*x + c)^4 - 30*I*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*e*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 60*I*(b*x*e + a*e)^4*B*a^2*b^3*c^
3*d^6*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 60*I*(b*x*e + a*e)^4*B*a
^3*b^2*c^2*d^7*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 30*I*(b*x*e + a
*e)^4*B*a^4*b*c*d^8*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 6*I*(b*x*e
 + a*e)^4*B*a^5*d^9*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 6*I*A*b^9*
c^5*e^5 + 11*I*B*b^9*c^5*e^5 + 30*I*A*a*b^8*c^4*d*e^5 - 55*I*B*a*b^8*c^4*d*
e^5 - 60*I*A*a^2*b^7*c^3*d^2*e^5 + 110*I*B*a^2*b^7*c^3*d^2*e^5 + 60*I*A*a^3
*b^6*c^2*d^3*e^5 - 110*I*B*a^3*b^6*c^2*d^3*e^5 - 30*I*A*a^4*b^5*c*d^4*e^5 +
 55*I*B*a^4*b^5*c*d^4*e^5 + 6*I*A*a^5*b^4*d^5*e^5 - 11*I*B*a^5*b^4*d^5*e^5
- 26*I*(b*x*e + a*e)*B*b^8*c^5*d*e^4/(d*x + c) + 130*I*(b*x*e + a*e)*B*a*b^
7*c^4*d^2*e^4/(d*x + c) - 260*I*(b*x*e + a*e)*B...
```

Mupad [B]

time = 4.80, size = 566, normalized size = 3.80

$$x\left(\frac{(4ad+4bc)\left(\frac{\left(\frac{d^2 i^3 (4Aad+16Abc+Bad-Bbc)}{4b}-\frac{Ad^2 i^3 (4ad+4bc)}{4b}\right)(4ad+4bc)}{4bd}-\frac{cdi^3 (4Aad+6Abc+Bad-Bbc)}{b}+\frac{Aacd^2 i^3}{b}\right)}{4bd}+\frac{c^2 i^3 (12Aad+8Abc+3Bad-3Bbc)}{2b}-\frac{ac\left(\frac{d^2 i^3 (4Aad+16Abc+Bad-Bbc)}{4b}-\frac{Ad^2 i^3 (4ad+4bc)}{4b}\right)}{bd}\right)-x^2\left(\frac{\left(\frac{d^2 i^3 (4Aad+16Abc+Bad-Bbc)}{4b}-\frac{Ad^2 i^3 (4ad+4bc)}{4b}\right)(4ad+4bc)}{8bd}-\frac{cdi^3 (4Aad+6Abc+Bad-Bbc)}{2b}+\frac{Aacd^2 i^3}{2b}\right)+\ln\left(\frac{e(a+bx)}{c+dx}\right)\left(Bc^3 i^3 x+\frac{3Bc^2 di^3 x^2}{2}+Bcd^2 i^3 x^3+\frac{Bd^3 i^3 x^4}{4}\right)+x^3\left(\frac{d^2 i^3 (4Aad+16Abc+Bad-Bbc)}{12b}-\frac{Ad^2 i^3 (4ad+4bc)}{12b}\right)-\frac{\ln(a+bx)\left(Ba^4 d^3 i^3-4Ba^3 bcd^2 i^3+6Ba^2 b^2 c^2 di^3-4Bab^3 c^3 i^3\right)}{4b^4}+\frac{Ad^3 i^3 x^4}{4}-\frac{Bc^4 i^3 \ln(c+dx)}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(((4*a*d + 4*b*c)*((((d^2*i^3*(4*A*a*d + 16*A*b*c + B*a*d - B*b*c))/(4*b)
 - (A*d^2*i^3*(4*a*d + 4*b*c))/(4*b))*(4*a*d + 4*b*c))/(4*b*d) - (c*d*i^3*(
4*A*a*d + 6*A*b*c + B*a*d - B*b*c))/b + (A*a*c*d^2*i^3)/b))/(4*b*d) + (c^2*
i^3*(12*A*a*d + 8*A*b*c + 3*B*a*d - 3*B*b*c))/(2*b) - (a*c*((d^2*i^3*(4*A*a
*d + 16*A*b*c + B*a*d - B*b*c))/(4*b) - (A*d^2*i^3*(4*a*d + 4*b*c))/(4*b)))
/(b*d)) - x^2*((((d^2*i^3*(4*A*a*d + 16*A*b*c + B*a*d - B*b*c))/(4*b) - (A*
d^2*i^3*(4*a*d + 4*b*c))/(4*b))*(4*a*d + 4*b*c))/(8*b*d) - (c*d*i^3*(4*A*a*
d + 6*A*b*c + B*a*d - B*b*c))/(2*b) + (A*a*c*d^2*i^3)/(2*b)) + log((e*(a +
b*x))/(c + d*x))*((B*d^3*i^3*x^4)/4 + B*c^3*i^3*x + (3*B*c^2*d*i^3*x^2)/2 +
 B*c*d^2*i^3*x^3) + x^3*((d^2*i^3*(4*A*a*d + 16*A*b*c + B*a*d - B*b*c))/(12
*b) - (A*d^2*i^3*(4*a*d + 4*b*c))/(12*b)) - (log(a + b*x)*(B*a^4*d^3*i^3 -
4*B*a*b^3*c^3*i^3 + 6*B*a^2*b^2*c^2*d*i^3 - 4*B*a^3*b*c*d^2*i^3))/(4*b^4) +
 (A*d^3*i^3*x^4)/4 - (B*c^4*i^3*log(c + d*x))/(4*d)
```

3.24 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=356

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

```
[Out] -5/6*B*d*(-a*d+b*c)^2*i^3*x/b^3/g-1/6*B*(-a*d+b*c)*i^3*(d*x+c)^2/b^2/g-5/6*
B*(-a*d+b*c)^3*i^3*ln((b*x+a)/(d*x+c))/b^4/g+d*(-a*d+b*c)^2*i^3*(b*x+a)*(A+
B*ln(e*(b*x+a)/(d*x+c)))/b^4/g+1/2*(-a*d+b*c)*i^3*(d*x+c)^2*(A+B*ln(e*(b*x+
a)/(d*x+c)))/b^2/g+1/3*i^3*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/g-11/6*B
*(-a*d+b*c)^3*i^3*ln(d*x+c)/b^4/g-(-a*d+b*c)^3*i^3*(A+B*ln(e*(b*x+a)/(d*x+c
)))*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g+B*(-a*d+b*c)^3*i^3*polylog(2,b*(d*x+c)/
d/(b*x+a))/b^4/g
```

Rubi [A]

time = 0.31, antiderivative size = 356, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2562, 2389, 2379, 2438, 2351, 31, 2356, 46}

$$\frac{Bi^3(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g}+\frac{di^3(a+bx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g}-\frac{i^3(bc-ad)^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g}+\frac{i^3(c+dx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g}+\frac{i^3(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3bg}-\frac{5Bi^3(bc-ad)^3\log\left(\frac{a+bx}{c+dx}\right)}{6b^4g}-\frac{11Bi^3(bc-ad)^3\log(c+dx)}{6b^4g}-\frac{5Bdi^3x(bc-ad)^2}{6b^3g}-\frac{Bi^3(c+dx)^2(bc-ad)}{6b^2g}$$

Antiderivative was successfully verified.

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

```
[Out] (-5*B*d*(b*c - a*d)^2*i^3*x)/(6*b^3*g) - (B*(b*c - a*d)*i^3*(c + d*x)^2)/(6
*b^2*g) - (5*B*(b*c - a*d)^3*i^3*Log[(a + b*x)/(c + d*x)])/(6*b^4*g) + (d*(
b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g) +
((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g
) + (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*g) - (11*B*
(b*c - a*d)^3*i^3*Log[c + d*x])/(6*b^4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[(
e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (B
*(b*c - a*d)^3*i^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g)
```

Rule 31

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

Rule 46

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

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

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

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(24c+24dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx = \int \left(\frac{13824d(bc-ad)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g} + \frac{576d(bc-a}{}\right.$$

$$= \frac{\left(13824(bc-ad)^3\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ag+bgx}\,dx}{b^3} + \frac{(24d)\int (24c+24dx}{}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g} + \frac{6912(bc-ad)(c+dx)^2\left(A+B\log\left(\right.\right.}{b^2g}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g} + \frac{13824Bd(bc-ad)^2(a+bx)\log\left(\frac{e(a+}{c+d}\right.}{b^4g}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g} + \frac{13824Bd(bc-ad)^2(a+bx)\log\left(\frac{e(a+}{c+d}\right.}{b^4g}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g} - \frac{11520Bd(bc-ad)^2x}{b^3g} - \frac{2304B(bc-}{b^2}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g} - \frac{11520Bd(bc-ad)^2x}{b^3g} - \frac{2304B(bc-}{b^2}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g} - \frac{11520Bd(bc-ad)^2x}{b^3g} - \frac{2304B(bc-}{b^2}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g} - \frac{11520Bd(bc-ad)^2x}{b^3g} - \frac{2304B(bc-}{b^2}$$

Mathematica [A]
time = 0.19, size = 352, normalized size = 0.99

$$\frac{i^3\left(6Abd(bc-ad)^2x-3B(bc-ad)^2(bdx+(bc-ad)\log(a+bx))-B(bc-ad)\left(2bd(bc-ad)x+b^2(c+dx)^2+2(bc-ad)^2\log(a+bx)\right)+6Bd(bc-ad)^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+3b^2(bc-ad)(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+2b^3(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+6(bc-ad)^3\log(g(a+bx))\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-6B(bc-ad)^3\log(c+dx)-3B(bc-ad)^3\left(\log(g(a+bx))\left(\log(g(a+bx))-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{6b^4g}$$

Antiderivative was successfully verified.

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

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

```
+ d*x)] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
) + 2*b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^
3*Log[g*(a + b*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3
*Log[c + d*x] - 3*B*(b*c - a*d)^3*(Log[g*(a + b*x)]*(Log[g*(a + b*x)] - 2*L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]
)))/(6*b^4*g)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 3912 vs. $2(344) = 688$.
time = 1.60, size = 3913, normalized size = 10.99

method	result	size
derivativedivides	Expression too large to display	3913
default	Expression too large to display	3913
risch	Expression too large to display	5361

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/d^2*e*(a*d-b*c)*(-A*d^4/e*i^3/g/b^4*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*d)*a^2+1/3*B*d^7/e*i^3/g/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^2-1/2*B*d^4/e*
i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(
b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*c^2-2*B*d^4*i^3/g/b^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*d)^2*a*c+2*B*d^5*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c+1/3*B*d
^5/e*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*c^2+B*d^5/e*i^3/g/b^4*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*d)*a^2+B*d^3/e*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*c^2+2*B*d^3/
e*i^3/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(-b*e+(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*d)/b/e)*a*c-B*d^4/e*i^3/g/b^4*dilog(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*d)/b/e)*a^2+1/2*B*d^4/e*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/b^4*
a^2+1/2*A*d^4*e*i^3/g/b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a^2-B*d^2
/e*i^3/g/b^2*dilog(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)/b/e)*c^2-2/3*A*d
^3*e^2*i^3/g/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c+1/3*A*d^2*e^2*i^3/
g*b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*c^2-2*A*d^3*i^3/g/b^2/(b*e-(b*e
/d+(a*d-b*c)*e/d/(d*x+c))*d)*a*c+5/3*B*d^3*i^3/g/b^2/(b*e-(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*d)*a*c-1/6*B*d^4*e*i^3/g/b^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*d)^2*a^2+A*d^4/e*i^3/g/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a^2+A*d^2/e*i^
3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c^2-A*d^2/e*i^3/g/b^2*ln(b*e-(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*d)*c^2+1/3*A*d^4*e^2*i^3/g/b/(b*e-(b*e/d+(a*d-b*c)*
```

```
e/d/(d*x+c))*d)^3*a^2+11/6*B*d^4/e*i^3/g/b^4*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*d)*a^2+11/6*B*d^2/e*i^3/g/b^2*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d
)*c^2+1/2*B*d^2/e*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/b^2*c^2+B*d^5*i^3
/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a^2+B*d^3*i^3/g/b*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d
)^2*c^2-B*d^6*i^3/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^2+2*A*d^3/e*i^3/g/b^
3*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a*c-2*A*d^3/e*i^3/g/b^3*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))*a*c-A*d^3*e*i^3/g/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*d)^2*a*c+1/3*B*d^3*e*i^3/g/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a*c
-B*d^4*i^3/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*c^2+B*d^3*e*i^3/g*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*d)^3*c^2+2*B*d^3/e*i^3/g/b^3*dilog(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*d)/b/e)*a*c-B*d^4/e*i^3/g/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(-b
*e+(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)/b/e)*a^2-B*d^2/e*i^3/g/b^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*ln(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)/b/e)*c^2-11/
3*B*d^3/e*i^3/g/b^3*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a*c-1/2*B*d^6/e
*i^3/g/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/
(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a^2+A*d^2*i^3/g/b/(b*e-(b*e/d+(a*d-
b*c)*e/d/(d*x+c))*d)*c^2+1/2*A*d^2*e*i^3/g/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*d)^2*c^2-1/6*B*d^2*e*i^3/g/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*c^2-5
/6*B*d^4*i^3/g/b^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^2-5/6*B*d^2*i^3/
g/b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*c^2+A*d^4*i^3/g/b^3/(b*e-(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*d)*a^2-B*d^3/e*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^
2/b^3*a*c-2*B*d^4*e*i^3/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c
)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c-2/3*B*d^6/e*i^3/
g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/(b*e-
(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c-2*B*d^4/e*i^3/g/b^3*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*d)*a*c+B*d^5/e*i^3/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-
b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a*c+B*d^5*e*i^3
/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^2)
```

Maxima [A]
time = 0.41, size = 643, normalized size = 1.81

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -3*I*A*c^2*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + 1/6*I*A*d^3*(6*a^3*log(b*
x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) - 3/2*I*A*c*d^2
*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) - I*A*c^3*log(b*g*x
 + a*g)/(b*g) + 1/6*(11*I*b^2*c^3 - 15*I*a*b*c^2*d + 6*I*a^2*c*d^2)*B*log(d
*x + c)/(b^3*g) + (-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d
^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)
/(b*c - a*d)))*B/(b^4*g) - 1/6*(2*I*B*b^3*d^3*x^3 - 2*(-4*I*b^3*c*d^2 + I*a
*b^2*d^3)*B*x^2 - 3*(-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3
*d^3)*B*log(b*x + a)^2 + (11*I*b^3*c^2*d - 6*I*a*b^2*c*d^2 + I*a^2*b*d^3)*B
*x + (2*I*B*b^3*d^3*x^3 - 3*(-3*I*b^3*c*d^2 + I*a*b^2*d^3)*B*x^2 - 6*(-3*I*
b^3*c^2*d + 3*I*a*b^2*c*d^2 - I*a^2*b*d^3)*B*x + (6*I*b^3*c^3 - 9*I*a^2*b*c
*d^2 + 5*I*a^3*d^3)*B)*log(b*x + a) + (-2*I*B*b^3*d^3*x^3 - 3*(3*I*b^3*c*d^
2 - I*a*b^2*d^3)*B*x^2 - 6*(3*I*b^3*c^2*d - 3*I*a*b^2*c*d^2 + I*a^2*b*d^3)*
B*x - 6*(I*b^3*c^3 - 3*I*a*b^2*c^2*d + 3*I*a^2*b*c*d^2 - I*a^3*d^3)*B*log(b
*x + a))*log(d*x + c))/(b^4*g)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{i^3\left(\int \frac{Ac^3}{a+bx}\,dx+\int \frac{Ad^3x^3}{a+bx}\,dx+\int \frac{Bc^3\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx+\int \frac{3Acd^2x^2}{a+bx}\,dx+\int \frac{3Ac^2dx}{a+bx}\,dx+\int \frac{Bd^3x^3\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx+\int \frac{3Bcd^2x^2\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx+\int \frac{3Bc^2dx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] i**3*(Integral(A*c**3/(a + b*x), x) + Integral(A*d**3*x**3/(a + b*x), x) +
Integral(B*c**3*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(a + b*x), x) + Integr
al(3*A*c*d**2*x**2/(a + b*x), x) + Integral(3*A*c**2*d*x/(a + b*x), x) + In
tegral(B*d**3*x**3*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(a + b*x), x) + Int
egral(3*B*c*d**2*x**2*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(a + b*x), x) +
Integral(3*B*c**2*d*x*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(a + b*x), x))/g
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((I*d*x + I*c)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g),
 x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.25 $\int \frac{(ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2} \, dx$

Optimal. Leaf size=373

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

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

Rubi [A]
time = 0.28, antiderivative size = 373, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.225$, Rules used = {2562, 46, 2393, 2341, 2356, 2351, 31, 2379, 2438}

$$\frac{3Bdi^3(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^2}+\frac{2d^2i^3(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^2}-\frac{3di^3(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^2}-\frac{i^3(c+dx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2(a+bx)}+\frac{di^3(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g^2}-\frac{Bdi^3(bc-ad)^2\log\left(\frac{a+bx}{c+dx}\right)}{2b^4g^2}-\frac{5Bdi^3(bc-ad)^2\log(c+dx)}{2b^4g^2}-\frac{Bd^2i^3x(bc-ad)}{2b^3g^2}-\frac{Bi^3(c+dx)(bc-ad)^2}{b^3g^2(a+bx)}$$

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 46

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

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

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

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

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(25c+25dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx = \int \left(\frac{15625d^2(3bc-2ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^2} + \frac{15625d^3x\big(\cdots}{\cdots}\right.$$

$$= \frac{\left(15625d^3\right)\int x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx}{b^2g^2} + \frac{\left(15625d^2(3bc-2a\cdots\right.}{\cdots}$$

$$= \frac{15625Ad^2(3bc-2ad)x}{b^3g^2} + \frac{15625d^3x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^2} - \cdots$$

$$= \frac{15625Ad^2(3bc-2ad)x}{b^3g^2} + \frac{15625Bd^2(3bc-2ad)(a+bx)\log\big(\cdots}{b^4g^2}$$

$$= \frac{15625Ad^2(3bc-2ad)x}{b^3g^2} + \frac{15625Bd^2(3bc-2ad)(a+bx)\log\big(\cdots}{b^4g^2}$$

$$= \frac{15625Ad^2(3bc-2ad)x}{b^3g^2} - \frac{15625Bd^2(bc-ad)x}{2b^3g^2} - \frac{15625B(bc\cdots}{b^4g^2(a+\cdots}$$

$$= \frac{15625Ad^2(3bc-2ad)x}{b^3g^2} - \frac{15625Bd^2(bc-ad)x}{2b^3g^2} - \frac{15625B(bc\cdots}{b^4g^2(a+\cdots}$$

$$= \frac{15625Ad^2(3bc-2ad)x}{b^3g^2} - \frac{15625Bd^2(bc-ad)x}{2b^3g^2} - \frac{15625B(bc\cdots}{b^4g^2(a+\cdots}$$

$$= \frac{15625Ad^2(3bc-2ad)x}{b^3g^2} - \frac{15625Bd^2(bc-ad)x}{2b^3g^2} - \frac{15625B(bc\cdots}{b^4g^2(a+\cdots}$$

Mathematica [A]
time = 0.27, size = 374, normalized size = 1.00

$$\frac{i^3\left(2Abd^2(3bc-2ad)x-bBd^2(bc-ad)x-\frac{2B(bc-ad)^3}{a+bx}-a^2Bd^3\log(a+bx)-2Bd(bc-ad)^2\log(a+bx)+2Bd^2(3bc-2ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+b^2d^3x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-\frac{2(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx}+6d(bc-ad)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+b^2Bc^2d\log(c+dx)+2Bd(bc-ad)^2\log(c+dx)-2Bd(-bc+ad)(-3bc+2ad)\log(c+dx)-3Bd(bc-ad)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{2b^4g^2}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 2021 vs. $2(365) = 730$.
time = 1.40, size = 2022, normalized size = 5.42

method	result	size
derivativedivides	Expression too large to display	2022
default	Expression too large to display	2022
risch	Expression too large to display	4732

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1158 vs. $2(341) = 682$.
time = 0.41, size = 1158, normalized size = 3.10

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
I*a^2*b^2*c^2*d^2 + 4*I*a^3*b*c*d^3 - I*a^4*d^4)*B - 6*((I*b^4*c^3*d - 3*I*
a*b^3*c^2*d^2 + 3*I*a^2*b^2*c*d^3 - I*a^3*b*d^4)*B*x + (I*a*b^3*c^3*d - 3*I
*a^2*b^2*c^2*d^2 + 3*I*a^3*b*c*d^3 - I*a^4*d^4)*B)*log(b*x + a))*log(d*x +
c))/(a*b^5*c*g^2 - a^2*b^4*d*g^2 + (b^6*c*g^2 - a*b^5*d*g^2)*x) + 3*(-I*b^2
*c^2*d + 2*I*a*b*c*d^2 - I*a^2*d^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c -
a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g^2)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{(a\,g+b\,g\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.26 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=345

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

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

Rubi [A]
time = 0.26, antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2562, 46, 2393, 2341, 2351, 31, 2379, 2438}

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

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 46

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

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

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2379

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

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(26c+26dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx = \int \left(\frac{17576d^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3} + \frac{17576(bc-ad)^3\left(A+\right.}{b^3g^3(a+}\right.$$

$$= \frac{(17576d^3)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{b^3g^3} + \frac{(52728d^2(bc-ad))}{b^3}$$

$$= \frac{17576Ad^3x}{b^3g^3} - \frac{8788(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2} - \frac{5272}{}$$

$$= \frac{17576Ad^3x}{b^3g^3} + \frac{17576Bd^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^3} - \frac{8788(bc-}{}$$

$$= \frac{17576Ad^3x}{b^3g^3} + \frac{17576Bd^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^3} - \frac{8788(bc-}{}$$

$$= \frac{17576Ad^3x}{b^3g^3} - \frac{4394B(bc-ad)^3}{b^4g^3(a+bx)^2} - \frac{43940Bd(bc-ad)^2}{b^4g^3(a+bx)} - \frac{439}{}$$

$$= \frac{17576Ad^3x}{b^3g^3} - \frac{4394B(bc-ad)^3}{b^4g^3(a+bx)^2} - \frac{43940Bd(bc-ad)^2}{b^4g^3(a+bx)} - \frac{439}{}$$

$$= \frac{17576Ad^3x}{b^3g^3} - \frac{4394B(bc-ad)^3}{b^4g^3(a+bx)^2} - \frac{43940Bd(bc-ad)^2}{b^4g^3(a+bx)} - \frac{439}{}$$

$$= \frac{17576Ad^3x}{b^3g^3} - \frac{4394B(bc-ad)^3}{b^4g^3(a+bx)^2} - \frac{43940Bd(bc-ad)^2}{b^4g^3(a+bx)} - \frac{439}{}$$

Mathematica [A]
time = 0.26, size = 314, normalized size = 0.91

$$\frac{i^3\left(4Abd^3x - \frac{B(bc-ad)^3}{(a+bx)^2} - \frac{10Bd(bc-ad)^2}{a+bx} + 10Bd^2(-bc+ad)\log(a+bx) + 4Bd^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right) - \frac{2(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)^2} - \frac{12d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx} + 12d^2(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) + 6Bd^2(bc-ad)\log(c+dx) + 6Bd^2(-bc+ad)\left(\log(a+bx)\left(\log(a+bx) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{4b^4g^3}$$

Antiderivative was successfully verified.

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

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 845 vs. $2(341) = 682$.

time = 1.38, size = 846, normalized size = 2.45

method	result
derivativedivides	$-\frac{e(ad-cb)\left(-\frac{i^3d^2eA}{2g^3b^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}+\frac{3i^3d^4A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e\,g^3b^4}-\frac{2i^3d^3A}{g^3b^3\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}+\frac{i^3d^4A}{g^3b^3\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}-\cdots\right.}{\cdots}$
default	$-\frac{e(ad-cb)\left(-\frac{i^3d^2eA}{2g^3b^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}+\frac{3i^3d^4A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e\,g^3b^4}-\frac{2i^3d^3A}{g^3b^3\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}+\frac{i^3d^4A}{g^3b^3\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}-\cdots\right.}{\cdots}$
risch	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1901 vs. $2(322) = 644$.

time = 0.47, size = 1901, normalized size = 5.51

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 3/4*I*B*c^2*d*(2*(2*b*x + a)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^4*g^3*
x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)
*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c
 - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c
*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b
^3*c*d + a^2*b^2*d^2)*g^3)) + 1/2*I*A*d^3*((6*a^2*b*x + 5*a^3)/(b^6*g^3*x^2
 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*log(b*x + a)/(b^4*g^3
)) - 3/2*I*A*c*d^2*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^
3*g^3) + 2*log(b*x + a)/(b^3*g^3)) - 1/4*I*B*c^3*((2*b*d*x - b*c + 3*a*d)/(
(b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^
3*b*d)*g^3) - 2*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2 + 2*a*b^2
*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^
2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) + 3
/2*I*(2*b*x + a)*A*c^2*d/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + 1/2*
I*A*c^3/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 1/2*(2*I*b^3*c^3*d^2 +
8*I*a*b^2*c^2*d^3 - 13*I*a^2*b*c*d^4 + 5*I*a^3*d^5)*B*log(d*x + c)/(b^6*c^2
*g^3 - 2*a*b^5*c*d*g^3 + a^2*b^4*d^2*g^3) + 1/4*(4*(-I*b^5*c^2*d^3 + 2*I*a*
b^4*c*d^4 - I*a^2*b^3*d^5)*B*x^3 + 8*(-I*a*b^4*c^2*d^3 + 2*I*a^2*b^3*c*d^4
- I*a^3*b^2*d^5)*B*x^2 + 2*(-24*I*a*b^4*c^3*d^2 + 55*I*a^2*b^3*c^2*d^3 - 40
*I*a^3*b^2*c*d^4 + 9*I*a^4*b*d^5)*B*x + 6*((-I*b^5*c^3*d^2 + 3*I*a*b^4*c^2*
d^3 - 3*I*a^2*b^3*c*d^4 + I*a^3*b^2*d^5)*B*x^2 + 2*(-I*a*b^4*c^3*d^2 + 3*I*
a^2*b^3*c^2*d^3 - 3*I*a^3*b^2*c*d^4 + I*a^4*b*d^5)*B*x + (-I*a^2*b^3*c^3*d^
2 + 3*I*a^3*b^2*c^2*d^3 - 3*I*a^4*b*c*d^4 + I*a^5*d^5)*B)*log(b*x + a)^2 -
(39*I*a^2*b^3*c^3*d^2 - 93*I*a^3*b^2*c^2*d^3 + 73*I*a^4*b*c*d^4 - 19*I*a^5*
d^5)*B + 2*(2*(-I*b^5*c^2*d^3 + 2*I*a*b^4*c*d^4 - I*a^2*b^3*d^5)*B*x^3 + (-
6*I*b^5*c^3*d^2 + 9*I*a^2*b^3*c*d^4 - 5*I*a^3*b^2*d^5)*B*x^2 + 2*(-12*I*a*b
^4*c^3*d^2 + 18*I*a^2*b^3*c^2*d^3 - 9*I*a^3*b^2*c*d^4 + I*a^4*b*d^5)*B*x +
(-15*I*a^2*b^3*c^3*d^2 + 27*I*a^3*b^2*c^2*d^3 - 18*I*a^4*b*c*d^4 + 4*I*a^5*
d^5)*B)*log(b*x + a) + 2*(2*(I*b^5*c^2*d^3 - 2*I*a*b^4*c*d^4 + I*a^2*b^3*d^
5)*B*x^3 + 4*(I*a*b^4*c^2*d^3 - 2*I*a^2*b^3*c*d^4 + I*a^3*b^2*d^5)*B*x^2 +
4*(3*I*a*b^4*c^3*d^2 - 7*I*a^2*b^3*c^2*d^3 + 5*I*a^3*b^2*c*d^4 - I*a^4*b*d^
5)*B*x + (9*I*a^2*b^3*c^3*d^2 - 23*I*a^3*b^2*c^2*d^3 + 19*I*a^4*b*c*d^4 - 5
*I*a^5*d^5)*B + 6*((I*b^5*c^3*d^2 - 3*I*a*b^4*c^2*d^3 + 3*I*a^2*b^3*c*d^4 -
 I*a^3*b^2*d^5)*B*x^2 + 2*(I*a*b^4*c^3*d^2 - 3*I*a^2*b^3*c^2*d^3 + 3*I*a^3*
b^2*c*d^4 - I*a^4*b*d^5)*B*x + (I*a^2*b^3*c^3*d^2 - 3*I*a^3*b^2*c^2*d^3 + 3
*I*a^4*b*c*d^4 - I*a^5*d^5)*B)*log(b*x + a))*log(d*x + c))/(a^2*b^6*c^2*g^3
 - 2*a^3*b^5*c*d*g^3 + a^4*b^4*d^2*g^3 + (b^8*c^2*g^3 - 2*a*b^7*c*d*g^3 + a
^2*b^6*d^2*g^3)*x^2 + 2*(a*b^7*c^2*g^3 - 2*a^2*b^6*c*d*g^3 + a^3*b^5*d^2*g^
3)*x) - 3*(I*b*c*d^2 - I*a*d^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d)
 + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g^3)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((I*d*x + I*c)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^
3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{(a\,g+b\,g\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.27 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=310

$$-\frac{Bd^2i^3(c+dx)}{b^3g^4(a+bx)}-\frac{Bdi^3(c+dx)^2}{4b^2g^4(a+bx)^2}-\frac{Bi^3(c+dx)^3}{9bg^4(a+bx)^3}-\frac{d^2i^3(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^4(a+bx)}-\frac{di^3(c+dx)^2\left(A+\right.}{2b^2g^4(a}$$

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

Rubi [A]

time = 0.28, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2562, 2380, 2341, 2379, 2438}

$$\frac{Bd^3i^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^4}-\frac{d^3i^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^4}-\frac{d^2i^3(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^4(a+bx)}-\frac{di^3(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g^4(a+bx)^2}-\frac{i^3(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3bg^4(a+bx)^3}-\frac{Bd^2i^3(c+dx)}{b^3g^4(a+bx)}-\frac{Bdi^3(c+dx)^2}{4b^2g^4(a+bx)^2}-\frac{Bi^3(c+dx)^3}{9bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^4,
x]
```

```
[Out] -((B*d^2*i^3*(c + d*x))/(b^3*g^4*(a + b*x))) - (B*d*i^3*(c + d*x)^2)/(4*b^2
*g^4*(a + b*x)^2) - (B*i^3*(c + d*x)^3)/(9*b*g^4*(a + b*x)^3) - (d^2*i^3*(c
 + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^4*(a + b*x)) - (d*i^3*
(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^4*(a + b*x)^2) -
 (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*g^4*(a + b*x)^
3) - (d^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d
*(a + b*x))])/(b^4*g^4) + (B*d^3*i^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))
])/(b^4*g^4)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2379

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

```
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(27c+27dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx = \int \left(\frac{19683(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^4(a+bx)^4} + \frac{59049d(bc-\cdots}{\cdots}\right.$$

$$= \frac{(19683d^3)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{b^3g^4} + \frac{(59049d^2(bc-ad))\int \frac{A+B\,\mathrm{lo}\cdots}{(a\cdots}}{b^3g^4}$$

$$= -\frac{6561(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^4(a+bx)^3} - \frac{59049d(bc-ad)^2\cdots}{2b^4g\cdots}$$

$$= -\frac{6561(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^4(a+bx)^3} - \frac{59049d(bc-ad)^2\cdots}{2b^4g\cdots}$$

$$= -\frac{6561(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^4(a+bx)^3} - \frac{59049d(bc-ad)^2\cdots}{2b^4g\cdots}$$

$$= -\frac{2187B(bc-ad)^3}{b^4g^4(a+bx)^3} - \frac{45927Bd(bc-ad)^2}{4b^4g^4(a+bx)^2} - \frac{72171Bd^2(bc-\cdots}{2b^4g^4(a+bx\cdots}$$

$$= -\frac{2187B(bc-ad)^3}{b^4g^4(a+bx)^3} - \frac{45927Bd(bc-ad)^2}{4b^4g^4(a+bx)^2} - \frac{72171Bd^2(bc-\cdots}{2b^4g^4(a+bx\cdots}$$

$$= -\frac{2187B(bc-ad)^3}{b^4g^4(a+bx)^3} - \frac{45927Bd(bc-ad)^2}{4b^4g^4(a+bx)^2} - \frac{72171Bd^2(bc-\cdots}{2b^4g^4(a+bx\cdots}$$

$$= -\frac{2187B(bc-ad)^3}{b^4g^4(a+bx)^3} - \frac{45927Bd(bc-ad)^2}{4b^4g^4(a+bx)^2} - \frac{72171Bd^2(bc-\cdots}{2b^4g^4(a+bx\cdots}$$

Mathematica [A]
time = 0.29, size = 308, normalized size = 0.99

$$\frac{i^3\left(-\frac{4B(bc-ad)^3}{(a+bx)^3} - \frac{21Bd(bc-ad)^2}{(a+bx)^2} + \frac{66Bd^2(-bc+ad)}{a+bx} - 66Bd^3\log(a+bx) - \frac{12(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)^3} - \frac{54d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)^2} + \frac{108d^2(-bc+ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx} + 36d^3\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) + 66Bd^3\log(c+dx) - 18Bd^3\left(\log(a+bx)\left(\log(a+bx) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\operatorname{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{36b^4g^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^4,x]
```

```
[Out] (i^3*((-4*B*(b*c - a*d)^3)/(a + b*x)^3 - (21*B*d*(b*c - a*d)^2)/(a + b*x)^2
 + (66*B*d^2*(-(b*c) + a*d))/(a + b*x) - 66*B*d^3*Log[a + b*x] - (12*(b*c -
 a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^3 - (54*d*(b*c - a*
d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^2 + (108*d^2*(-(b*c) +
 a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x) + 36*d^3*Log[a + b*x]
```

```
*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 66*B*d^3*Log[c + d*x] - 18*B*d^3*(L
og[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2
, (d*(a + b*x))/(-(b*c) + a*d)])))/(36*b^4*g^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 938 vs. $2(302) = 604$.
time = 1.34, size = 939, normalized size = 3.03 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x,method=_RETUR
NVERBOSE)
```

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

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="maxima")
```

```
[Out] 1/6*I*B*d^3*((18*a*b^2*x^2 + 27*a^2*b*x + 11*a^3 + 6*(b^3*x^3 + 3*a*b^2*x^2
 + 3*a^2*b*x + a^3)*log(b*x + a))*log(d*x + c)/(b^7*g^4*x^3 + 3*a*b^6*g^4*x
^2 + 3*a^2*b^5*g^4*x + a^3*b^4*g^4) - 6*integrate(1/6*(6*b^4*d*x^4 + 45*a^2
*b^2*d*x^2 + 38*a^3*b*d*x + 11*a^4*d + 6*(b^4*c + 3*a*b^3*d)*x^3 + 6*(2*b^4
*d*x^4 + 6*a^2*b^2*d*x^2 + 4*a^3*b*d*x + a^4*d + (b^4*c + 4*a*b^3*d)*x^3)*l
og(b*x + a))/(b^8*d*g^4*x^5 + a^4*b^4*c*g^4 + (b^8*c*g^4 + 4*a*b^7*d*g^4)*x
^4 + 2*(2*a*b^7*c*g^4 + 3*a^2*b^6*d*g^4)*x^3 + 2*(3*a^2*b^6*c*g^4 + 2*a^3*b
^5*d*g^4)*x^2 + (4*a^3*b^5*c*g^4 + a^4*b^4*d*g^4)*x), x)) + 1/6*I*B*c*d^2*(
6*(3*b^2*x^2 + 3*a*b*x + a^2)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^6*g^4
```

```
*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + (11*a^2*b^2*c^2 -
 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 +
3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d +
a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2
+ 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^
4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log
(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) -
 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c
^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4)) + 1/12*I*B*c^2*d*(6*(3*b*x + a)
*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^
2*b^3*g^4*x + a^3*b^2*g^4) + (5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3
*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/(
(b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*
d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^
4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d
^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)
*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^
2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) + 1/18*I*B*c^3*((6*b^2*d^2*x^2 + 2*b^2*c^2
 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*
c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^
4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2
- 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*log(b*x*e/(d*x + c) + a*e/(d*x + c))/
(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b
*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d
^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^
4)) - 1/6*I*A*d^3*((18*a*b^2*x^2 + 27*a^2*b*x + 11*a^3)/(b^7*g^4*x^3 + 3*a*
b^6*g^4*x^2 + 3*a^2*b^5*g^4*x + a^3*b^4*g^4) + 6*log(b*x + a)/(b^4*g^4)) +
1/2*I*(3*b*x + a)*A*c^2*d/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x
+ a^3*b^2*g^4) + I*(3*b^2*x^2 + 3*a*b*x + a^2)*A*c*d^2/(b^6*g^4*x^3 + 3*a*b
^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + 1/3*I*A*c^3/(b^4*g^4*x^3 + 3*
a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="fricas")
```

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

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4,x)
```

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="giac")
```

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

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^3\,\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}{{\left(a\,g+b\,g\,x\right)}^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x))))/(a*g + b*g*x)^4,
x)
```

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

3.28 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=89

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

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

Rubi [A]
time = 0.07, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.050$, Rules used = {2562, 2341}

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

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^5,
x]
```

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

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(28c+28dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx = \int \left(\frac{21952(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^5} + \frac{65856d(bc-a\ldots}{b\ldots}\right.$$

$$= \frac{(21952d^3)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{b^3g^5} + \frac{(65856d^2(bc-ad))\int \frac{A+B\log\ldots}{(a+\ldots}}{b^3g^5}$$

$$= -\frac{5488(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^5(a+bx)^4} - \frac{21952d(bc-ad)^2\ldots}{b^4g^5(\ldots}$$

$$= -\frac{5488(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^5(a+bx)^4} - \frac{21952d(bc-ad)^2\ldots}{b^4g^5(\ldots}$$

$$= -\frac{5488(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^5(a+bx)^4} - \frac{21952d(bc-ad)^2\ldots}{b^4g^5(\ldots}$$

$$= -\frac{1372B(bc-ad)^3}{b^4g^5(a+bx)^4} - \frac{5488Bd(bc-ad)^2}{b^4g^5(a+bx)^3} - \frac{8232Bd^2(bc-ad)}{b^4g^5(a+bx)^2}\ldots$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 427 vs. 2(89) = 178.
time = 0.33, size = 427, normalized size = 4.80

$$-\frac{i^3\left(4Ab^4c^4+b^4Bc^4-4a^4Ad^4-a^4Bd^4+16Ab^4c^3dx+4b^4Bc^3dx-16a^3Abd^4x-4a^3bBd^4x+24Ab^4c^2d^2x^2+6b^4Bc^2d^2x^2-24a^2Ab^2d^4x^2-6a^2b^2Bd^4x^2+16Ab^4cd^3x^3+4b^4Bcd^3x^3-16aAb^3d^4x^3-4ab^3Bd^4x^3+4Bd^4(a+bx)^4\log(a+bx)+4B(-a^4d^4-4a^3bd^4x-6a^2b^2d^4x^2-4ab^3d^4x^3+b^4c(c^3+4c^2dx+6cd^2x^2+4d^3x^3))\log\left(\frac{e(a+bx)}{c+dx}\right)-4a^4Bd^4\log(c+dx)-16a^3bBd^4x\log(c+dx)-24a^2b^2Bd^4x^2\log(c+dx)-16ab^3Bd^4x^3\log(c+dx)-4b^4Bd^4x^4\log(c+dx)\right)}{16b^4(bc-ad)g^5(a+bx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^5,x]
```

```
[Out] -1/16*(i^3*(4*A*b^4*c^4 + b^4*B*c^4 - 4*a^4*A*d^4 - a^4*B*d^4 + 16*A*b^4*c^
3*d*x + 4*b^4*B*c^3*d*x - 16*a^3*A*b*d^4*x - 4*a^3*b*B*d^4*x + 24*A*b^4*c^2
*d^2*x^2 + 6*b^4*B*c^2*d^2*x^2 - 24*a^2*A*b^2*d^4*x^2 - 6*a^2*b^2*B*d^4*x^2
 + 16*A*b^4*c*d^3*x^3 + 4*b^4*B*c*d^3*x^3 - 16*a*A*b^3*d^4*x^3 - 4*a*b^3*B*
d^4*x^3 + 4*B*d^4*(a + b*x)^4*Log[a + b*x] + 4*B*(-(a^4*d^4) - 4*a^3*b*d^4*
x - 6*a^2*b^2*d^4*x^2 - 4*a*b^3*d^4*x^3 + b^4*c*(c^3 + 4*c^2*d*x + 6*c*d^2*
x^2 + 4*d^3*x^3))*Log[(e*(a + b*x))/(c + d*x)] - 4*a^4*B*d^4*Log[c + d*x] -
 16*a^3*b*B*d^4*x*Log[c + d*x] - 24*a^2*b^2*B*d^4*x^2*Log[c + d*x] - 16*a*b
^3*B*d^4*x^3*Log[c + d*x] - 4*b^4*B*d^4*x^4*Log[c + d*x]))/(b^4*(b*c - a*d)
*g^5*(a + b*x)^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 184 vs. 2(85) = 170.
time = 0.66, size = 185, normalized size = 2.08

method	result
derivativedivides	$-\frac{e(ad-cb)\left(-\frac{i^3d^2e^3A}{4(ad-cb)^2g^5\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^4}+\frac{i^3d^2e^3B\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{4\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^4}-\frac{1}{16\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^4}\right)}{(ad-cb)^2g^5}\right)}{d^2}$
default	$-\frac{e(ad-cb)\left(-\frac{i^3d^2e^3A}{4(ad-cb)^2g^5\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^4}+\frac{i^3d^2e^3B\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{4\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^4}-\frac{1}{16\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^4}\right)}{(ad-cb)^2g^5}\right)}{d^2}$
norman	$\frac{Bc\,d^3i^3x^3\ln\left(\frac{e(bx+a)}{dx+c}\right)}{(ad-cb)g}+\frac{B\,c^3d\,i^3x\ln\left(\frac{e(bx+a)}{dx+c}\right)}{g(ad-cb)}+\frac{\left(4A\,c^3i^3+i^3c^3B\right)x}{4ga}+\frac{3\left(4Aa\,c^2d\,i^3+4Ab\,c^3i^3+Ba\,c^2d\,i^3+Bb\,c^3i^3\right)x^2}{8g\,a^2}+\frac{(4A\,c}{}$
risch	$-\frac{i^3B\left(4d^3x^3b^3+6a\,b^2d^3x^2+6b^3c\,d^2x^2+4a^2b\,d^3x+4a\,b^2c\,d^2x+4b^3c^2dx+a^3d^3+a^2bc\,d^2+b^2c^2da+b^3c^3\right)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{4(bx+a)^4g^5b^4}-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x,method=_RETUR
NVERBOSE)
```

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3091 vs. $2(80) = 160$.
time = 0.51, size = 3091, normalized size = 34.73

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="maxima")
```

```
[Out] 1/48*I*B*d^3*(12*(4*b^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*log(b*x*e/(d*x
 + c) + a*e/(d*x + c))/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*a^2*b^6*g^5*x^2 +
 4*a^3*b^5*g^5*x + a^4*b^4*g^5) + (25*a^3*b^3*c^3 - 23*a^4*b^2*c^2*d + 13*a
^5*b*c*d^2 - 3*a^6*d^3 + 12*(4*b^6*c^3 - 6*a*b^5*c^2*d + 4*a^2*b^4*c*d^2 -
a^3*b^3*d^3)*x^3 + 6*(18*a*b^5*c^3 - 22*a^2*b^4*c^2*d + 13*a^3*b^3*c*d^2 -
3*a^4*b^2*d^3)*x^2 + 4*(22*a^2*b^4*c^3 - 23*a^3*b^3*c^2*d + 13*a^4*b^2*c*d^
2 - 3*a^5*b*d^3)*x)/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8
*d^3)*g^5*x^4 + 4*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7
```

```
*d^3)*g^5*x^3 + 6*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^
6*d^3)*g^5*x^2 + 4*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b
^5*d^3)*g^5*x + (a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*
d^3)*g^5) + 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)*lo
g(b*x + a)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d^3
+ a^4*b^4*d^4)*g^5) - 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a
^3*d^4)*log(d*x + c)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*
b^5*c*d^3 + a^4*b^4*d^4)*g^5)) + 1/48*I*B*c*d^2*(12*(6*b^2*x^2 + 4*a*b*x +
a^2)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 +
6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) + (13*a^2*b^3*c^3 - 75*a
^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2
 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*
a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 -
7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)
*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*
g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)
*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3
)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g
^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4
*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12
*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c
^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)) + 1/48*I*B*
c^2*d*(12*(4*b*x + a)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^6*g^5*x^4 + 4
*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + (7*a*
b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2
- a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4
*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^
3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 -
 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3
- 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3
 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 -
3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d
^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*
c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 -
 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) -
 1/48*I*B*c^3*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^
2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c
*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b
^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^
4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b
^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*
b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d
^3)*g^5) - 12*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g
^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x
+ a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*
```

```
b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2
*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) + 1/4*I*(4*b*x + a)*A*c^2*d/(b^6*
g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g
^5) + 1/4*I*(6*b^2*x^2 + 4*a*b*x + a^2)*A*c*d^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*
x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) + 1/4*I*(4*b^3*x^3
 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*A*d^3/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*
a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) + 1/4*I*A*c^3/(b^5*g^5*x^4
 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 339 vs. $2(80) = 160$.
time = 0.43, size = 339, normalized size = 3.81

$$-\frac{(-4i\,A-i\,B)b^4c^4+(4i\,A+i\,B)a^4d^4-4\left(((4i\,A+i\,B)b^4cd^3+(-4i\,A-i\,B)ab^3d^4)x^3-6\left(((4i\,A+i\,B)b^4c^2d^2+(-4i\,A-i\,B)a^2b^2d^4)x^2-4\left(((4i\,A+i\,B)b^4c^3d+(-4i\,A-i\,B)a^3bd^4)x-4\left(i\,Bb^4d^4x^4+4i\,Bb^4cd^3x^3+6i\,Bb^4c^2d^2x^2+4i\,Bb^4c^3dx+i\,Bb^4c^4\right)\log\left(\frac{(bx+a)e}{dx+c}\right)\right.\right.\right.}{16\left((b^9c-ab^8d)g^5x^4+4\left(ab^8c-a^2b^7d\right)g^5x^3+6\left(a^2b^7c-a^3b^6d\right)g^5x^2+4\left(a^3b^6c-a^4b^5d\right)g^5x+\left(a^4b^5c-a^5b^4d\right)g^5\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="fricas")
```

```
[Out] -1/16*((-4*I*A - I*B)*b^4*c^4 + (4*I*A + I*B)*a^4*d^4 - 4*((4*I*A + I*B)*b^
4*c*d^3 + (-4*I*A - I*B)*a*b^3*d^4)*x^3 - 6*((4*I*A + I*B)*b^4*c^2*d^2 + (-
4*I*A - I*B)*a^2*b^2*d^4)*x^2 - 4*((4*I*A + I*B)*b^4*c^3*d + (-4*I*A - I*B)
*a^3*b*d^4)*x - 4*(I*B*b^4*d^4*x^4 + 4*I*B*b^4*c*d^3*x^3 + 6*I*B*b^4*c^2*d^
2*x^2 + 4*I*B*b^4*c^3*d*x + I*B*b^4*c^4)*log((b*x + a)*e/(d*x + c)))/((b^9*
c - a*b^8*d)*g^5*x^4 + 4*(a*b^8*c - a^2*b^7*d)*g^5*x^3 + 6*(a^2*b^7*c - a^3
*b^6*d)*g^5*x^2 + 4*(a^3*b^6*c - a^4*b^5*d)*g^5*x + (a^4*b^5*c - a^5*b^4*d)
*g^5)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [A]
time = 6.38, size = 115, normalized size = 1.29

$$\frac{\left(4i\,Be^5\log\left(\frac{bxe+ae}{dx+c}\right)+4i\,Ae^5+i\,Be^5\right)(dx+c)^4\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{16\,(bxe+ae)^4g^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="giac")
```

```
[Out] 1/16*(4*I*B*e^5*log((b*x*e + a*e)/(d*x + c)) + 4*I*A*e^5 + I*B*e^5)*(d*x +
c)^4*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d))
)/((b*x*e + a*e)^4*g^5)
```

Mupad [B]
time = 7.16, size = 780, normalized size = 8.76

$$-\frac{x^3\,\left(4\,A\,b^3\,d^3\,i^3+B\,b^3\,d^3\,i^3\right)+x^2\,\left(6\,A\,a\,b^2\,d^3\,i^3+\frac{3\,B\,a\,b^2\,d^3\,i^3}{2}+6\,A\,b^3\,c\,d^2\,i^3+\frac{3\,B\,b^3\,c\,d^2\,i^3}{2}\right)+x\,\left(4\,A\,a^2\,b\,d^3\,i^3+B\,a^2\,b\,d^3\,i^3+4\,A\,b^3\,c^2\,d\,i^3+B\,b^3\,c^2\,d\,i^3+4\,A\,a\,b^2\,c\,d^2\,i^3+B\,a\,b^2\,c\,d^2\,i^3\right)+A\,a^3\,d^3\,i^3+A\,b^3\,c^3\,i^3+\frac{B\,a^3\,d^3\,i^3}{4}+\frac{B\,b^3\,c^3\,i^3}{4}+A\,a\,b^2\,c^2\,d\,i^3+A\,a^2\,b\,c\,d^2\,i^3+\frac{B\,a\,b^2\,c^2\,d\,i^3}{4}+\frac{B\,a^2\,b\,c\,d^2\,i^3}{4}}{4\,a^4\,b^4\,g^5+16\,a^3\,b^5\,g^5\,x+24\,a^2\,b^6\,g^5\,x^2+16\,a\,b^7\,g^5\,x^3+4\,b^8\,g^5\,x^4}-\frac{\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(x^2\,\left(b\,\left(b\,\left(\frac{B\,a\,d^3\,i^3}{4\,b^5\,g^5}+\frac{B\,c\,d^2\,i^3}{4\,b^4\,g^5}\right)+\frac{B\,a\,d^3\,i^3}{2\,b^4\,g^5}+\frac{B\,c\,d^2\,i^3}{2\,b^3\,g^5}\right)+\frac{3\,B\,a\,d^3\,i^3}{4\,b^3\,g^5}+\frac{3\,B\,c\,d^2\,i^3}{4\,b^2\,g^5}\right)+x\,\left(b\,\left(a\,\left(\frac{B\,a\,d^3\,i^3}{4\,b^5\,g^5}+\frac{B\,c\,d^2\,i^3}{4\,b^4\,g^5}\right)+\frac{B\,c^2\,d\,i^3}{4\,b^3\,g^5}\right)+a\,\left(b\,\left(\frac{B\,a\,d^3\,i^3}{4\,b^5\,g^5}+\frac{B\,c\,d^2\,i^3}{4\,b^4\,g^5}\right)+\frac{B\,a\,d^3\,i^3}{2\,b^4\,g^5}+\frac{B\,c\,d^2\,i^3}{2\,b^3\,g^5}\right)+\frac{3\,B\,c^2\,d\,i^3}{4\,b^2\,g^5}\right)+a\,\left(a\,\left(\frac{B\,a\,d^3\,i^3}{4\,b^5\,g^5}+\frac{B\,c\,d^2\,i^3}{4\,b^4\,g^5}\right)+\frac{B\,c^2\,d\,i^3}{4\,b^3\,g^5}\right)+\frac{B\,c^3\,i^3}{4\,b^2\,g^5}+\frac{B\,d^3\,i^3\,x^3}{b^2\,g^5}\right)}{4\,a^3\,x+\frac{a^4}{b}+b^3\,x^4+6\,a^2\,b\,x^2+4\,a\,b^2\,x^3}-\frac{B\,d^4\,i^3\,\mathrm{atan}\left(\frac{b\,c\,2{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}+1{}\mathrm{i}\right)\,1{}\mathrm{i}}{2\,b^4\,g^5\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x))))/(a*g + b*g*x)^5,
x)
```

```
[Out] - (x^3*(4*A*b^3*d^3*i^3 + B*b^3*d^3*i^3) + x^2*(6*A*a*b^2*d^3*i^3 + (3*B*a*
b^2*d^3*i^3)/2 + 6*A*b^3*c*d^2*i^3 + (3*B*b^3*c*d^2*i^3)/2) + x*(4*A*a^2*b*
d^3*i^3 + B*a^2*b*d^3*i^3 + 4*A*b^3*c^2*d*i^3 + B*b^3*c^2*d*i^3 + 4*A*a*b^2
*c*d^2*i^3 + B*a*b^2*c*d^2*i^3) + A*a^3*d^3*i^3 + A*b^3*c^3*i^3 + (B*a^3*d^
3*i^3)/4 + (B*b^3*c^3*i^3)/4 + A*a*b^2*c^2*d*i^3 + A*a^2*b*c*d^2*i^3 + (B*a
*b^2*c^2*d*i^3)/4 + (B*a^2*b*c*d^2*i^3)/4)/(4*a^4*b^4*g^5 + 4*b^8*g^5*x^4 +
 16*a^3*b^5*g^5*x + 16*a*b^7*g^5*x^3 + 24*a^2*b^6*g^5*x^2) - (log((e*(a + b
*x))/(c + d*x))*(x^2*(b*(b*((B*a*d^3*i^3)/(4*b^5*g^5) + (B*c*d^2*i^3)/(4*b^
4*g^5)) + (B*a*d^3*i^3)/(2*b^4*g^5) + (B*c*d^2*i^3)/(2*b^3*g^5)) + (3*B*a*d
^3*i^3)/(4*b^3*g^5) + (3*B*c*d^2*i^3)/(4*b^2*g^5)) + x*(b*(a*((B*a*d^3*i^3)
/(4*b^5*g^5) + (B*c*d^2*i^3)/(4*b^4*g^5)) + (B*c^2*d*i^3)/(4*b^3*g^5)) + a*
(b*((B*a*d^3*i^3)/(4*b^5*g^5) + (B*c*d^2*i^3)/(4*b^4*g^5)) + (B*a*d^3*i^3)/
(2*b^4*g^5) + (B*c*d^2*i^3)/(2*b^3*g^5)) + (3*B*c^2*d*i^3)/(4*b^2*g^5)) + a
*(a*((B*a*d^3*i^3)/(4*b^5*g^5) + (B*c*d^2*i^3)/(4*b^4*g^5)) + (B*c^2*d*i^3)
/(4*b^3*g^5)) + (B*c^3*i^3)/(4*b^2*g^5) + (B*d^3*i^3*x^3)/(b^2*g^5)))/(4*a^
3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 + 4*a*b^2*x^3) - (B*d^4*i^3*atan((b*c*2
i + b*d*x*2i)/(a*d - b*c) + 1i)*1i)/(2*b^4*g^5*(a*d - b*c))
```

3.29 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=181

$$\frac{Bdi^3(c+dx)^4}{16(bc-ad)^2g^6(a+bx)^4}-\frac{bBi^3(c+dx)^5}{25(bc-ad)^2g^6(a+bx)^5}+\frac{di^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4(bc-ad)^2g^6(a+bx)^4}-\frac{bi^3(c+dx)^5\left(A+\dots\right.}{5(bc-ad)\dots}$$

```
[Out] 1/16*B*d*i^3*(d*x+c)^4/(-a*d+b*c)^2/g^6/(b*x+a)^4-1/25*b*B*i^3*(d*x+c)^5/(-
a*d+b*c)^2/g^6/(b*x+a)^5+1/4*d*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-
a*d+b*c)^2/g^6/(b*x+a)^4-1/5*b*i^3*(d*x+c)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-
a*d+b*c)^2/g^6/(b*x+a)^5
```

Rubi [A]
time = 0.11, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 45, 2372, 12}

$$-\frac{bi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5g^6(a+bx)^5(bc-ad)^2}+\frac{di^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^6(a+bx)^4(bc-ad)^2}-\frac{bBi^3(c+dx)^5}{25g^6(a+bx)^5(bc-ad)^2}+\frac{Bdi^3(c+dx)^4}{16g^6(a+bx)^4(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^6,
x]
```

```
[Out] (B*d*i^3*(c + d*x)^4)/(16*(b*c - a*d)^2*g^6*(a + b*x)^4) - (b*B*i^3*(c + d*
x)^5)/(25*(b*c - a*d)^2*g^6*(a + b*x)^5) + (d*i^3*(c + d*x)^4*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/(4*(b*c - a*d)^2*g^6*(a + b*x)^4) - (b*i^3*(c + d*
x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*(b*c - a*d)^2*g^6*(a + b*x)^5
)
```

Rule 12

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

Rule 45

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

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
```

```
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(29c+29dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx = \int \left(\frac{24389(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^6(a+bx)^6} + \frac{73167d(bc-a\ldots}{b\ldots}\right.$$

$$= \frac{(24389d^3)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{b^3g^6} + \frac{(73167d^2(bc-ad))\int \frac{A+B\log\ldots}{(a+\ldots}}{b^3g^6}$$

$$= -\frac{24389(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^4g^6(a+bx)^5} - \frac{73167d(bc-ad)^2\ldots}{4b^4g\ldots}$$

$$= -\frac{24389(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^4g^6(a+bx)^5} - \frac{73167d(bc-ad)^2\ldots}{4b^4g\ldots}$$

$$= -\frac{24389(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^4g^6(a+bx)^5} - \frac{73167d(bc-ad)^2\ldots}{4b^4g\ldots}$$

$$= -\frac{24389B(bc-ad)^3}{25b^4g^6(a+bx)^5} - \frac{268279Bd(bc-ad)^2}{80b^4g^6(a+bx)^4} - \frac{73167Bd^2(bc-\ldots}{20b^4g^6(a+b\ldots}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 608 vs. 2(181) = 362.
time = 0.39, size = 608, normalized size = 3.36

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^6,x]
```

```
[Out] -1/400*(i^3*(80*A*b^5*c^5 + 16*b^5*B*c^5 - 100*a*A*b^4*c^4*d - 25*a*b^4*B*c
^4*d + 20*a^5*A*d^5 + 9*a^5*B*d^5 + 300*A*b^5*c^4*d*x + 55*b^5*B*c^4*d*x -
400*a*A*b^4*c^3*d^2*x - 100*a*b^4*B*c^3*d^2*x + 100*a^4*A*b*d^5*x + 45*a^4*
b*B*d^5*x + 400*A*b^5*c^3*d^2*x^2 + 60*b^5*B*c^3*d^2*x^2 - 600*a*A*b^4*c^2*
d^3*x^2 - 150*a*b^4*B*c^2*d^3*x^2 + 200*a^3*A*b^2*d^5*x^2 + 90*a^3*b^2*B*d^
5*x^2 + 200*A*b^5*c^2*d^3*x^3 + 10*b^5*B*c^2*d^3*x^3 - 400*a*A*b^4*c*d^4*x^
3 - 100*a*b^4*B*c*d^4*x^3 + 200*a^2*A*b^3*d^5*x^3 + 90*a^2*b^3*B*d^5*x^3 -
20*b^5*B*c*d^4*x^4 + 20*a*b^4*B*d^5*x^4 - 20*B*d^5*(a + b*x)^5*Log[a + b*x]
 + 20*B*(b*c - a*d)^2*(a^3*d^3 + a^2*b*d^2*(2*c + 5*d*x) + a*b^2*d*(3*c^2 +
 10*c*d*x + 10*d^2*x^2) + b^3*(4*c^3 + 15*c^2*d*x + 20*c*d^2*x^2 + 10*d^3*x
^3))*Log[(e*(a + b*x))/(c + d*x)] + 20*a^5*B*d^5*Log[c + d*x] + 100*a^4*b*B
*d^5*x*Log[c + d*x] + 200*a^3*b^2*B*d^5*x^2*Log[c + d*x] + 200*a^2*b^3*B*d^
5*x^3*Log[c + d*x] + 100*a*b^4*B*d^5*x^4*Log[c + d*x] + 20*b^5*B*d^5*x^5*Lo
g[c + d*x]))/(b^4*(b*c - a*d)^2*g^6*(a + b*x)^5)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 356 vs. $2(173) = 346$.
time = 0.75, size = 357, normalized size = 1.97 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/5*i^3*d^2*e^4/(a*d-b*c)^3/g^6*A*b/(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^5-1/4*i^3*d^3*e^3/(a*d-b*c)^3/g^6*A/(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^4-i^3*d^2*e^4/(a*d-b*c)^3/g^6*B*b*(-1/5/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/25/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5)+i^3*d^
3*e^3/(a*d-b*c)^3/g^6*B*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))-1/16/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4))
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 4202 vs. $2(163) = 326$.
time = 0.63, size = 4202, normalized size = 23.22

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="maxima")
```

```
[Out] 1/1200*I*B*d^3*(60*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*x + a^3)*log(b*x*e/
(d*x + c) + a*e/(d*x + c))/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g^6*
x^3 + 10*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) + (77*a^3*b^4*c^4
 - 548*a^4*b^3*c^3*d + 352*a^5*b^2*c^2*d^2 - 148*a^6*b*c*d^3 + 27*a^7*d^4 -
```

60*(10*b^7*c^3*d - 10*a*b^6*c^2*d^2 + 5*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^4 +
30*(10*b^7*c^4 - 100*a*b^6*c^3*d + 95*a^2*b^5*c^2*d^2 - 46*a^3*b^4*c*d^3 +
9*a^4*b^3*d^4)*x^3 + 10*(50*a*b^6*c^4 - 410*a^2*b^5*c^3*d + 337*a^3*b^4*c^
2*d^2 - 148*a^4*b^3*c*d^3 + 27*a^5*b^2*d^4)*x^2 + 5*(65*a^2*b^5*c^4 - 488*a
^3*b^4*c^3*d + 352*a^4*b^3*c^2*d^2 - 148*a^5*b^2*c*d^3 + 27*a^6*b*d^4)*x)/(
(b^13*c^4 - 4*a*b^12*c^3*d + 6*a^2*b^11*c^2*d^2 - 4*a^3*b^10*c*d^3 + a^4*b^
9*d^4)*g^6*x^5 + 5*(a*b^12*c^4 - 4*a^2*b^11*c^3*d + 6*a^3*b^10*c^2*d^2 - 4*
a^4*b^9*c*d^3 + a^5*b^8*d^4)*g^6*x^4 + 10*(a^2*b^11*c^4 - 4*a^3*b^10*c^3*d
+ 6*a^4*b^9*c^2*d^2 - 4*a^5*b^8*c*d^3 + a^6*b^7*d^4)*g^6*x^3 + 10*(a^3*b^10
*c^4 - 4*a^4*b^9*c^3*d + 6*a^5*b^8*c^2*d^2 - 4*a^6*b^7*c*d^3 + a^7*b^6*d^4)
*g^6*x^2 + 5*(a^4*b^9*c^4 - 4*a^5*b^8*c^3*d + 6*a^6*b^7*c^2*d^2 - 4*a^7*b^6
*c*d^3 + a^8*b^5*d^4)*g^6*x + (a^5*b^8*c^4 - 4*a^6*b^7*c^3*d + 6*a^7*b^6*c^
2*d^2 - 4*a^8*b^5*c*d^3 + a^9*b^4*d^4)*g^6) - 60*(10*b^3*c^3*d^2 - 10*a*b^2
*c^2*d^3 + 5*a^2*b*c*d^4 - a^3*d^5)*log(b*x + a)/((b^9*c^5 - 5*a*b^8*c^4*d
+ 10*a^2*b^7*c^3*d^2 - 10*a^3*b^6*c^2*d^3 + 5*a^4*b^5*c*d^4 - a^5*b^4*d^5)*
g^6) + 60*(10*b^3*c^3*d^2 - 10*a*b^2*c^2*d^3 + 5*a^2*b*c*d^4 - a^3*d^5)*log
(d*x + c)/((b^9*c^5 - 5*a*b^8*c^4*d + 10*a^2*b^7*c^3*d^2 - 10*a^3*b^6*c^2*d
^3 + 5*a^4*b^5*c*d^4 - a^5*b^4*d^5)*g^6)) + 1/600*I*B*c*d^2*(60*(10*b^2*x^2
+ 5*a*b*x + a^2)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^8*g^6*x^5 + 5*a*b
^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^
5*b^3*g^6) + (47*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 27
8*a^5*b*c*d^3 + 47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d
^4)*x^4 - 30*(10*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^
3*d^4)*x^3 + 10*(20*b^6*c^4 - 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a
^3*b^3*c*d^3 + 47*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d +
702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a
*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 +
5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a
^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^
2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^
3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b
^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^
4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c
*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(
b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^
3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4
+ a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10
*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6)) + 1/400*I*B*c^2*d*(
60*(5*b*x + a)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^7*g^6*x^5 + 5*a*b^6*
g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b
^2*g^6) + (27*a*b^4*c^4 - 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4
*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^
2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d
^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3
*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4

```
- 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x
^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3
+ a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*
d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*
c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4
*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*
d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3
*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5
- 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4
 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*
b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5
*b^2*d^5)*g^6)) + 1/300*I*B*c^3*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^
3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 -
 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^
2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)
/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6
*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*
b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 620 vs. 2(163) = 326.
time = 0.41, size = 620, normalized size = 3.43

$$-\frac{16\left(-5iA-iB\right)b^5c^5+25\left(4iA+iB\right)ab^4c^4d-\left(20iA+9iB\right)a^5d^5+20\left(iBb^5cd^4-iBab^4d^5\right)x^4+10\left(\left(-20iA-iB\right)b^5c^2d^3+10\left(4iA+iB\right)ab^4cd^4+\left(-20iA-9iB\right)a^2b^3d^5\right)x^3+10\left(2\left(-20iA-3iB\right)b^5c^3d^2+15\left(4iA+iB\right)ab^4c^2d^3+\left(-20iA-9iB\right)a^3b^2d^5\right)x^2+5\left(\left(-60iA-11iB\right)b^5c^4d+20\left(4iA+iB\right)ab^4c^3d^2+\left(-20iA-9iB\right)a^4bd^5\right)x+20\left(iBb^5d^5x^5+5iBab^4d^5x^4-4iBb^5c^5+5iBab^4c^4d+10\left(-iBb^5c^2d^3+2iBab^4cd^4\right)x^3+10\left(-2iBb^5c^3d^2+3iBab^4c^2d^3\right)x^2+5\left(-3iBb^5c^4d+4iBab^4c^3d^2\right)x\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{400\left(\left(b^{11}c^2-2ab^{10}cd+a^2b^9d^2\right)g^6x^5+5\left(ab^{10}c^2-2a^2b^9cd+a^3b^8d^2\right)g^6x^4+10\left(a^2b^9c^2-2a^3b^8cd+a^4b^7d^2\right)g^6x^3+10\left(a^3b^8c^2-2a^4b^7cd+a^5b^6d^2\right)g^6x^2+5\left(a^4b^7c^2-2a^5b^6cd+a^6b^5d^2\right)g^6x+\left(a^5b^6c^2-2a^6b^5cd+a^7b^4d^2\right)g^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="fricas")
```

```
[Out] -1/400*(16*(-5*I*A - I*B)*b^5*c^5 + 25*(4*I*A + I*B)*a*b^4*c^4*d - (20*I*A
+ 9*I*B)*a^5*d^5 + 20*(I*B*b^5*c*d^4 - I*B*a*b^4*d^5)*x^4 + 10*((-20*I*A -
I*B)*b^5*c^2*d^3 + 10*(4*I*A + I*B)*a*b^4*c*d^4 + (-20*I*A - 9*I*B)*a^2*b^3
*d^5)*x^3 + 10*(2*(-20*I*A - 3*I*B)*b^5*c^3*d^2 + 15*(4*I*A + I*B)*a*b^4*c^
2*d^3 + (-20*I*A - 9*I*B)*a^3*b^2*d^5)*x^2 + 5*((-60*I*A - 11*I*B)*b^5*c^4*
d + 20*(4*I*A + I*B)*a*b^4*c^3*d^2 + (-20*I*A - 9*I*B)*a^4*b*d^5)*x + 20*(I
*B*b^5*d^5*x^5 + 5*I*B*a*b^4*d^5*x^4 - 4*I*B*b^5*c^5 + 5*I*B*a*b^4*c^4*d +
10*(-I*B*b^5*c^2*d^3 + 2*I*B*a*b^4*c*d^4)*x^3 + 10*(-2*I*B*b^5*c^3*d^2 + 3*
I*B*a*b^4*c^2*d^3)*x^2 + 5*(-3*I*B*b^5*c^4*d + 4*I*B*a*b^4*c^3*d^2)*x)*log(
(b*x + a)*e/(d*x + c)))/((b^11*c^2 - 2*a*b^10*c*d + a^2*b^9*d^2)*g^6*x^5 +
5*(a*b^10*c^2 - 2*a^2*b^9*c*d + a^3*b^8*d^2)*g^6*x^4 + 10*(a^2*b^9*c^2 - 2*
a^3*b^8*c*d + a^4*b^7*d^2)*g^6*x^3 + 10*(a^3*b^8*c^2 - 2*a^4*b^7*c*d + a^5*
b^6*d^2)*g^6*x^2 + 5*(a^4*b^7*c^2 - 2*a^5*b^6*c*d + a^6*b^5*d^2)*g^6*x + (a
^5*b^6*c^2 - 2*a^6*b^5*c*d + a^7*b^4*d^2)*g^6)
```

Sympy [F(-1)] Timed out

time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

Giac [A]
time = 4.00, size = 238, normalized size = 1.31

$$-\frac{\left(-80i\,Bbe^6\log\left(\frac{bxe+ae}{dx+c}\right)+\frac{100i\,(bxe+ae)Bde^5\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-80i\,Abe^6-16i\,Bbe^6+\frac{100i\,(bxe+ae)Ade^5}{dx+c}+\frac{25i\,(bxe+ae)Bde^5}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{400\left(\frac{(bxe+ae)^5bcg^6}{(dx+c)^5}-\frac{(bxe+ae)^5adg^6}{(dx+c)^5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="giac")
```

```
[Out] -1/400*(-80*I*B*b*e^6*log((b*x*e + a*e)/(d*x + c)) + 100*I*(b*x*e + a*e)*B*
d*e^5*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 80*I*A*b*e^6 - 16*I*B*b*e^6
+ 100*I*(b*x*e + a*e)*A*d*e^5/(d*x + c) + 25*I*(b*x*e + a*e)*B*d*e^5/(d*x +
 c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d))
)/((b*x*e + a*e)^5*b*c*g^6/(d*x + c)^5 - (b*x*e + a*e)^5*a*d*g^6/(d*x + c)^
5)
```

Mupad [B]
time = 8.31, size = 1053, normalized size = 5.82

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x))))/(a*g + b*g*x)^6,
x)
```

```
[Out] - ((20*A*a^4*d^4*i^3 - 80*A*b^4*c^4*i^3 + 9*B*a^4*d^4*i^3 - 16*B*b^4*c^4*i^
3 + 20*A*a^2*b^2*c^2*d^2*i^3 + 9*B*a^2*b^2*c^2*d^2*i^3 + 20*A*a*b^3*c^3*d*i
^3 + 20*A*a^3*b*c*d^3*i^3 + 9*B*a*b^3*c^3*d*i^3 + 9*B*a^3*b*c*d^3*i^3)/(20*
(a*d - b*c)) + (x^2*(20*A*a^2*b^2*d^4*i^3 + 9*B*a^2*b^2*d^4*i^3 - 40*A*b^4*
c^2*d^2*i^3 - 6*B*b^4*c^2*d^2*i^3 + 20*A*a*b^3*c*d^3*i^3 + 9*B*a*b^3*c*d^3*
i^3))/(2*(a*d - b*c)) + (x*(20*A*a^3*b*d^4*i^3 + 9*B*a^3*b*d^4*i^3 - 60*A*b
^4*c^3*d*i^3 - 11*B*b^4*c^3*d*i^3 + 20*A*a*b^3*c^2*d^2*i^3 + 20*A*a^2*b^2*c
*d^3*i^3 + 9*B*a*b^3*c^2*d^2*i^3 + 9*B*a^2*b^2*c*d^3*i^3))/(4*(a*d - b*c))
+ (x^3*(20*A*a*b^3*d^4*i^3 + 9*B*a*b^3*d^4*i^3 - 20*A*b^4*c*d^3*i^3 - B*b^4
*c*d^3*i^3))/(2*(a*d - b*c)) + (B*b^4*d^4*i^3*x^4)/(a*d - b*c))/(20*a^5*b^4
```

```
*g^6 + 20*b^9*g^6*x^5 + 100*a^4*b^5*g^6*x + 100*a*b^8*g^6*x^4 + 200*a^3*b^6
*g^6*x^2 + 200*a^2*b^7*g^6*x^3) - (log((e*(a + b*x))/(c + d*x))*(x^2*(b*(b*
((B*a*d^3*i^3)/(20*b^5*g^6) + (B*c*d^2*i^3)/(10*b^4*g^6)) + (3*B*a*d^3*i^3)
/(20*b^4*g^6) + (3*B*c*d^2*i^3)/(10*b^3*g^6)) + (3*B*a*d^3*i^3)/(10*b^3*g^6
) + (3*B*c*d^2*i^3)/(5*b^2*g^6)) + x*(b*(a*((B*a*d^3*i^3)/(20*b^5*g^6) + (B
*c*d^2*i^3)/(10*b^4*g^6)) + (3*B*c^2*d*i^3)/(20*b^3*g^6)) + a*(b*((B*a*d^3*
i^3)/(20*b^5*g^6) + (B*c*d^2*i^3)/(10*b^4*g^6)) + (3*B*a*d^3*i^3)/(20*b^4*g
^6) + (3*B*c*d^2*i^3)/(10*b^3*g^6)) + (3*B*c^2*d*i^3)/(5*b^2*g^6)) + a*(a*(
(B*a*d^3*i^3)/(20*b^5*g^6) + (B*c*d^2*i^3)/(10*b^4*g^6)) + (3*B*c^2*d*i^3)/
(20*b^3*g^6)) + (B*c^3*i^3)/(5*b^2*g^6) + (B*d^3*i^3*x^3)/(2*b^2*g^6)))/(5*
a^4*x + a^5/b + b^4*x^5 + 10*a^3*b*x^2 + 5*a*b^3*x^4 + 10*a^2*b^2*x^3) - (B
*d^5*i^3*atanh((20*b^6*c^2*g^6 - 20*a^2*b^4*d^2*g^6)/(20*b^4*g^6*(a*d - b*c
)^2) - (2*b*d*x)/(a*d - b*c)))/(10*b^4*g^6*(a*d - b*c)^2)
```

3.30 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^7}\,dx$

Optimal. Leaf size=281

$$-\frac{Bd^2i^3(c+dx)^4}{16(bc-ad)^3g^7(a+bx)^4}+\frac{2bBdi^3(c+dx)^5}{25(bc-ad)^3g^7(a+bx)^5}-\frac{b^2Bi^3(c+dx)^6}{36(bc-ad)^3g^7(a+bx)^6}-\frac{d^2i^3(c+dx)^4\left(A+B\log\left(\frac{e}{}\right.\right.}{4(bc-ad)^3g^7(a+bx}$$

```
[Out] -1/16*B*d^2*i^3*(d*x+c)^4/(-a*d+b*c)^3/g^7/(b*x+a)^4+2/25*b*B*d*i^3*(d*x+c)
^5/(-a*d+b*c)^3/g^7/(b*x+a)^5-1/36*b^2*B*i^3*(d*x+c)^6/(-a*d+b*c)^3/g^7/(b*
x+a)^6-1/4*d^2*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^7/(
b*x+a)^4+2/5*b*d*i^3*(d*x+c)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^7
/(b*x+a)^5-1/6*b^2*i^3*(d*x+c)^6*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g
^7/(b*x+a)^6
```

Rubi [A]
time = 0.15, antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2562, 45, 2372, 12, 14}

$$-\frac{b^2i^3(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6g^7(a+bx)^6(bc-ad)^3}-\frac{d^2i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^7(a+bx)^4(bc-ad)^3}+\frac{2bdi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5g^7(a+bx)^5(bc-ad)^3}-\frac{b^2Bi^3(c+dx)^6}{36g^7(a+bx)^6(bc-ad)^3}-\frac{Bd^2i^3(c+dx)^4}{16g^7(a+bx)^4(bc-ad)^3}+\frac{2bBdi^3(c+dx)^5}{25g^7(a+bx)^5(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^7,
x]
```

```
[Out] -1/16*(B*d^2*i^3*(c + d*x)^4)/((b*c - a*d)^3*g^7*(a + b*x)^4) + (2*b*B*d*i^
3*(c + d*x)^5)/(25*(b*c - a*d)^3*g^7*(a + b*x)^5) - (b^2*B*i^3*(c + d*x)^6)
/(36*(b*c - a*d)^3*g^7*(a + b*x)^6) - (d^2*i^3*(c + d*x)^4*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(4*(b*c - a*d)^3*g^7*(a + b*x)^4) + (2*b*d*i^3*(c + d
*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*(b*c - a*d)^3*g^7*(a + b*x)^
5) - (b^2*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*(b*c - a
*d)^3*g^7*(a + b*x)^6)
```

Rule 12

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

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

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

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(30c+30dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^7}\,dx = \int \left(\frac{27000(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^7(a+bx)^7} + \frac{81000d(bc-$$

$$= \frac{(27000d^3)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}\,dx}{b^3g^7} + \frac{(81000d^2(bc-ad))\int \frac{A+B\log}{(a}$$

$$= -\frac{4500(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^7(a+bx)^6} - \frac{16200d(bc-ad)^2}{b^4g^7}$$

$$= -\frac{4500(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^7(a+bx)^6} - \frac{16200d(bc-ad)^2}{b^4g^7}$$

$$= -\frac{4500(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^7(a+bx)^6} - \frac{16200d(bc-ad)^2}{b^4g^7}$$

$$= -\frac{750B(bc-ad)^3}{b^4g^7(a+bx)^6} - \frac{2340Bd(bc-ad)^2}{b^4g^7(a+bx)^5} - \frac{4275Bd^2(bc-ad)}{2b^4g^7(a+bx)^4}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 642 vs. $2(281) = 562$.
time = 0.68, size = 642, normalized size = 2.28

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^7,x]
```

```
[Out] (i^3*(-100*B*(b*c - a*d)^6 + 432*a*B*d*(-(b*c) + a*d)^5 - 432*b*B*d*(b*c -
a*d)^5*x + 540*a*B*d^2*(b*c - a*d)^4*(a + b*x) + 120*B*d*(b*c - a*d)^5*(a +
 b*x) + 540*b*B*d^2*(b*c - a*d)^4*x*(a + b*x) - 825*B*d^2*(b*c - a*d)^4*(a
+ b*x)^2 + 720*a*B*d^3*(-(b*c) + a*d)^3*(a + b*x)^2 - 720*b*B*d^3*(b*c - a*
d)^3*x*(a + b*x)^2 + 1080*a*B*d^4*(b*c - a*d)^2*(a + b*x)^3 + 700*B*d^3*(b*
c - a*d)^3*(a + b*x)^3 + 1080*b*B*d^4*(b*c - a*d)^2*x*(a + b*x)^3 - 1050*B*
d^4*(b*c - a*d)^2*(a + b*x)^4 + 2160*a*B*d^5*(-(b*c) + a*d)*(a + b*x)^4 - 2
160*b*B*d^5*(b*c - a*d)*x*(a + b*x)^4 + 2100*B*d^5*(b*c - a*d)*(a + b*x)^5
- 2160*a*B*d^6*(a + b*x)^5*Log[a + b*x] - 2160*b*B*d^6*x*(a + b*x)^5*Log[a
+ b*x] + 2100*B*d^6*(a + b*x)^6*Log[a + b*x] - 600*(b*c - a*d)^6*(A + B*Log
[(e*(a + b*x))/(c + d*x)]) + 2160*d*(-(b*c) + a*d)^5*(a + b*x)*(A + B*Log[(
e*(a + b*x))/(c + d*x)]) - 2700*d^2*(b*c - a*d)^4*(a + b*x)^2*(A + B*Log[(e
*(a + b*x))/(c + d*x)]) + 1200*d^3*(-(b*c) + a*d)^3*(a + b*x)^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)]) + 2160*a*B*d^6*(a + b*x)^5*Log[c + d*x] + 2160*b*
B*d^6*x*(a + b*x)^5*Log[c + d*x] - 2100*B*d^6*(a + b*x)^6*Log[c + d*x]))/(3
600*b^4*(b*c - a*d)^3*g^7*(a + b*x)^6)
```

Maple [A]
time = 0.80, size = 532, normalized size = 1.89 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/6*i^3*d^2*e^5/(a*d-b*c)^4/g^7*A*b^2/(b*e/d+(a*d-b*c)
*e/d/(d*x+c))^6+2/5*i^3*d^3*e^4/(a*d-b*c)^4/g^7*A*b/(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^5-1/4*i^3*d^4*e^3/(a*d-b*c)^4/g^7*A/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4+
i^3*d^2*e^5/(a*d-b*c)^4/g^7*B*b^2*(-1/6/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^6*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/36/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^6)-2*i^3*d^
3*e^4/(a*d-b*c)^4/g^7*B*b*(-1/5/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))-1/25/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5)+i^3*d^4*e^3/(a*d
-b*c)^4/g^7*B*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-1/16/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5508 vs. $2(254) = 508$.

time = 0.76, size = 5508, normalized size = 19.60

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7,x, algor
ithm="maxima")
```

```
[Out] 1/3600*I*B*d^3*(60*(20*b^3*x^3 + 15*a*b^2*x^2 + 6*a^2*b*x + a^3)*log(b*x*e/
(d*x + c) + a*e/(d*x + c))/(b^10*g^7*x^6 + 6*a*b^9*g^7*x^5 + 15*a^2*b^8*g^7
*x^4 + 20*a^3*b^7*g^7*x^3 + 15*a^4*b^6*g^7*x^2 + 6*a^5*b^5*g^7*x + a^6*b^4*
g^7) + (57*a^3*b^5*c^5 - 405*a^4*b^4*c^4*d + 1470*a^5*b^3*c^3*d^2 - 730*a^6
*b^2*c^2*d^3 + 245*a^7*b*c*d^4 - 37*a^8*d^5 + 60*(20*b^8*c^3*d^2 - 15*a*b^7
*c^2*d^3 + 6*a^2*b^6*c*d^4 - a^3*b^5*d^5)*x^5 - 30*(20*b^8*c^4*d - 235*a*b^
7*c^3*d^2 + 171*a^2*b^6*c^2*d^3 - 67*a^3*b^5*c*d^4 + 11*a^4*b^4*d^5)*x^4 +
20*(20*b^8*c^5 - 175*a*b^7*c^4*d + 866*a^2*b^6*c^3*d^2 - 604*a^3*b^5*c^2*d^
3 + 230*a^4*b^4*c*d^4 - 37*a^5*b^3*d^5)*x^3 + 15*(35*a*b^7*c^5 - 271*a^2*b^
6*c^4*d + 1128*a^3*b^5*c^3*d^2 - 700*a^4*b^4*c^2*d^3 + 245*a^5*b^3*c*d^4 -
37*a^6*b^2*d^5)*x^2 + 6*(47*a^2*b^6*c^5 - 345*a^3*b^5*c^4*d + 1320*a^4*b^4*
c^3*d^2 - 730*a^5*b^3*c^2*d^3 + 245*a^6*b^2*c*d^4 - 37*a^7*b*d^5)*x)/((b^15
*c^5 - 5*a*b^14*c^4*d + 10*a^2*b^13*c^3*d^2 - 10*a^3*b^12*c^2*d^3 + 5*a^4*b
^11*c*d^4 - a^5*b^10*d^5)*g^7*x^6 + 6*(a*b^14*c^5 - 5*a^2*b^13*c^4*d + 10*a
^3*b^12*c^3*d^2 - 10*a^4*b^11*c^2*d^3 + 5*a^5*b^10*c*d^4 - a^6*b^9*d^5)*g^7
*x^5 + 15*(a^2*b^13*c^5 - 5*a^3*b^12*c^4*d + 10*a^4*b^11*c^3*d^2 - 10*a^5*b
^10*c^2*d^3 + 5*a^6*b^9*c*d^4 - a^7*b^8*d^5)*g^7*x^4 + 20*(a^3*b^12*c^5 - 5
*a^4*b^11*c^4*d + 10*a^5*b^10*c^3*d^2 - 10*a^6*b^9*c^2*d^3 + 5*a^7*b^8*c*d^
4 - a^8*b^7*d^5)*g^7*x^3 + 15*(a^4*b^11*c^5 - 5*a^5*b^10*c^4*d + 10*a^6*b^9
*c^3*d^2 - 10*a^7*b^8*c^2*d^3 + 5*a^8*b^7*c*d^4 - a^9*b^6*d^5)*g^7*x^2 + 6*
(a^5*b^10*c^5 - 5*a^6*b^9*c^4*d + 10*a^7*b^8*c^3*d^2 - 10*a^8*b^7*c^2*d^3 +
 5*a^9*b^6*c*d^4 - a^10*b^5*d^5)*g^7*x + (a^6*b^9*c^5 - 5*a^7*b^8*c^4*d + 1
0*a^8*b^7*c^3*d^2 - 10*a^9*b^6*c^2*d^3 + 5*a^10*b^5*c*d^4 - a^11*b^4*d^5)*g
^7) + 60*(20*b^3*c^3*d^3 - 15*a*b^2*c^2*d^4 + 6*a^2*b*c*d^5 - a^3*d^6)*log(
b*x + a)/((b^10*c^6 - 6*a*b^9*c^5*d + 15*a^2*b^8*c^4*d^2 - 20*a^3*b^7*c^3*d
^3 + 15*a^4*b^6*c^2*d^4 - 6*a^5*b^5*c*d^5 + a^6*b^4*d^6)*g^7) - 60*(20*b^3*
c^3*d^3 - 15*a*b^2*c^2*d^4 + 6*a^2*b*c*d^5 - a^3*d^6)*log(d*x + c)/((b^10*c
^6 - 6*a*b^9*c^5*d + 15*a^2*b^8*c^4*d^2 - 20*a^3*b^7*c^3*d^3 + 15*a^4*b^6*c
^2*d^4 - 6*a^5*b^5*c*d^5 + a^6*b^4*d^6)*g^7)) + 1/1200*I*B*c*d^2*(60*(15*b^
2*x^2 + 6*a*b*x + a^2)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^9*g^7*x^6 +
6*a*b^8*g^7*x^5 + 15*a^2*b^7*g^7*x^4 + 20*a^3*b^6*g^7*x^3 + 15*a^4*b^5*g^7*
x^2 + 6*a^5*b^4*g^7*x + a^6*b^3*g^7) + (37*a^2*b^5*c^5 - 245*a^3*b^4*c^4*d
+ 730*a^4*b^3*c^3*d^2 - 1470*a^5*b^2*c^2*d^3 + 405*a^6*b*c*d^4 - 57*a^7*d^5
 - 60*(15*b^7*c^2*d^3 - 6*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 30*(15*b^7*c^3*d
^2 - 171*a*b^6*c^2*d^3 + 67*a^2*b^5*c*d^4 - 11*a^3*b^4*d^5)*x^4 - 20*(15*b^
7*c^4*d - 126*a*b^6*c^3*d^2 + 604*a^2*b^5*c^2*d^3 - 230*a^3*b^4*c*d^4 + 37*
a^4*b^3*d^5)*x^3 + 15*(15*b^7*c^5 - 111*a*b^6*c^4*d + 388*a^2*b^5*c^3*d^2 -
```

```
 1000*a^3*b^4*c^2*d^3 + 365*a^4*b^3*c*d^4 - 57*a^5*b^2*d^5)*x^2 + 6*(27*a*b
^6*c^5 - 185*a^2*b^5*c^4*d + 580*a^3*b^4*c^3*d^2 - 1270*a^4*b^3*c^2*d^3 + 4
05*a^5*b^2*c*d^4 - 57*a^6*b*d^5)*x)/((b^14*c^5 - 5*a*b^13*c^4*d + 10*a^2*b^
12*c^3*d^2 - 10*a^3*b^11*c^2*d^3 + 5*a^4*b^10*c*d^4 - a^5*b^9*d^5)*g^7*x^6
+ 6*(a*b^13*c^5 - 5*a^2*b^12*c^4*d + 10*a^3*b^11*c^3*d^2 - 10*a^4*b^10*c^2*
d^3 + 5*a^5*b^9*c*d^4 - a^6*b^8*d^5)*g^7*x^5 + 15*(a^2*b^12*c^5 - 5*a^3*b^1
1*c^4*d + 10*a^4*b^10*c^3*d^2 - 10*a^5*b^9*c^2*d^3 + 5*a^6*b^8*c*d^4 - a^7*
b^7*d^5)*g^7*x^4 + 20*(a^3*b^11*c^5 - 5*a^4*b^10*c^4*d + 10*a^5*b^9*c^3*d^2
 - 10*a^6*b^8*c^2*d^3 + 5*a^7*b^7*c*d^4 - a^8*b^6*d^5)*g^7*x^3 + 15*(a^4*b^
10*c^5 - 5*a^5*b^9*c^4*d + 10*a^6*b^8*c^3*d^2 - 10*a^7*b^7*c^2*d^3 + 5*a^8*
b^6*c*d^4 - a^9*b^5*d^5)*g^7*x^2 + 6*(a^5*b^9*c^5 - 5*a^6*b^8*c^4*d + 10*a^
7*b^7*c^3*d^2 - 10*a^8*b^6*c^2*d^3 + 5*a^9*b^5*c*d^4 - a^10*b^4*d^5)*g^7*x
+ (a^6*b^8*c^5 - 5*a^7*b^7*c^4*d + 10*a^8*b^6*c^3*d^2 - 10*a^9*b^5*c^2*d^3
+ 5*a^10*b^4*c*d^4 - a^11*b^3*d^5)*g^7) - 60*(15*b^2*c^2*d^4 - 6*a*b*c*d^5
+ a^2*d^6)*log(b*x + a)/((b^9*c^6 - 6*a*b^8*c^5*d + 15*a^2*b^7*c^4*d^2 - 20
*a^3*b^6*c^3*d^3 + 15*a^4*b^5*c^2*d^4 - 6*a^5*b^4*c*d^5 + a^6*b^3*d^6)*g^7)
 + 60*(15*b^2*c^2*d^4 - 6*a*b*c*d^5 + a^2*d^6)*log(d*x + c)/((b^9*c^6 - 6*a
*b^8*c^5*d + 15*a^2*b^7*c^4*d^2 - 20*a^3*b^6*c^3*d^3 + 15*a^4*b^5*c^2*d^4 -
 6*a^5*b^4*c*d^5 + a^6*b^3*d^6)*g^7)) + 1/600*I*B*c^2*d*(60*(6*b*x + a)*log
(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^8*g^7*x^6 + 6*a*b^7*g^7*x^5 + 15*a^2*b
^6*g^7*x^4 + 20*a^3*b^5*g^7*x^3 + 15*a^4*b^4*g^7*x^2 + 6*a^5*b^3*g^7*x + a^
6*b^2*g^7) + (22*a*b^5*c^5 - 140*a^2*b^4*c^4*d + 385*a^3*b^3*c^3*d^2 - 615*
a^4*b^2*c^2*d^3 + 735*a^5*b*c*d^4 - 87*a^6*d^5 + 60*(6*b^6*c*d^4 - a*b^5*d^
5)*x^5 - 30*(6*b^6*c^2*d^3 - 67*a*b^5*c*d^4 + 11*a^2*b^4*d^5)*x^4 + 20*(6*b
^6*c^3*d^2 - 49*a*b^5*c^2*d^3 + 230*a^2*b^4*c*d^4 - 37*a^3*b^3*d^5)*x^3 - 1
5*(6*b^6*c^4*d - 43*a*b^5*c^3*d^2 + 145*a^2*b^4*c^2*d^3 - 365*a^3*b^3*c*d^4
 + 57*a^4*b^2*d^5)*x^2 + 6*(12*b^6*c^5 - 80*a*b^5*c^4*d + 235*a^2*b^4*c^3*d
^2 - 415*a^3*b^3*c^2*d^3 + 585*a^4*b^2*c*d^4 - 87*a^5*b*d^5)*x)/((b^13*c^5
- 5*a*b^12*c^4*d + 10*a^2*b^11*c^3*d^2 - 10*a^3*b^10*c^2*d^3 + 5*a^4*b^9*c*
d^4 - a^5*b^8*d^5)*g^7*x^6 + 6*(a*b^12*c^5 - 5*...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 964 vs. $2(254) = 508$.
time = 0.40, size = 964, normalized size = 3.43

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7,x, algor
ithm="fricas")
```

```
[Out] 1/3600*(100*(6*I*A + I*B)*b^6*c^6 + 288*(-5*I*A - I*B)*a*b^5*c^5*d + 225*(4
*I*A + I*B)*a^2*b^4*c^4*d^2 - (60*I*A + 37*I*B)*a^6*d^6 + 60*(I*B*b^6*c*d^5
 - I*B*a*b^5*d^6)*x^5 + 30*(-I*B*b^6*c^2*d^4 + 12*I*B*a*b^5*c*d^5 - 11*I*B*
a^2*b^4*d^6)*x^4 + 20*((60*I*A + I*B)*b^6*c^3*d^3 + 9*(-20*I*A - I*B)*a*b^5
```

```
*c^2*d^4 + 45*(4*I*A + I*B)*a^2*b^4*c*d^5 + (-60*I*A - 37*I*B)*a^3*b^3*d^6)
*x^3 + 15*((180*I*A + 19*I*B)*b^6*c^4*d^2 + 24*(-20*I*A - 3*I*B)*a*b^5*c^3*
d^3 + 90*(4*I*A + I*B)*a^2*b^4*c^2*d^4 + (-60*I*A - 37*I*B)*a^4*b^2*d^6)*x^
2 + 6*(4*(90*I*A + 13*I*B)*b^6*c^5*d + 15*(-60*I*A - 11*I*B)*a*b^5*c^4*d^2
+ 150*(4*I*A + I*B)*a^2*b^4*c^3*d^3 + (-60*I*A - 37*I*B)*a^5*b*d^6)*x + 60*
(I*B*b^6*d^6*x^6 + 6*I*B*a*b^5*d^6*x^5 + 15*I*B*a^2*b^4*d^6*x^4 + 10*I*B*b^
6*c^6 - 24*I*B*a*b^5*c^5*d + 15*I*B*a^2*b^4*c^4*d^2 + 20*(I*B*b^6*c^3*d^3 -
 3*I*B*a*b^5*c^2*d^4 + 3*I*B*a^2*b^4*c*d^5)*x^3 + 15*(3*I*B*b^6*c^4*d^2 - 8
*I*B*a*b^5*c^3*d^3 + 6*I*B*a^2*b^4*c^2*d^4)*x^2 + 6*(6*I*B*b^6*c^5*d - 15*I
*B*a*b^5*c^4*d^2 + 10*I*B*a^2*b^4*c^3*d^3)*x)*log((b*x + a)*e/(d*x + c)))/(
(b^13*c^3 - 3*a*b^12*c^2*d + 3*a^2*b^11*c*d^2 - a^3*b^10*d^3)*g^7*x^6 + 6*(
a*b^12*c^3 - 3*a^2*b^11*c^2*d + 3*a^3*b^10*c*d^2 - a^4*b^9*d^3)*g^7*x^5 + 1
5*(a^2*b^11*c^3 - 3*a^3*b^10*c^2*d + 3*a^4*b^9*c*d^2 - a^5*b^8*d^3)*g^7*x^4
 + 20*(a^3*b^10*c^3 - 3*a^4*b^9*c^2*d + 3*a^5*b^8*c*d^2 - a^6*b^7*d^3)*g^7*
x^3 + 15*(a^4*b^9*c^3 - 3*a^5*b^8*c^2*d + 3*a^6*b^7*c*d^2 - a^7*b^6*d^3)*g^
7*x^2 + 6*(a^5*b^8*c^3 - 3*a^6*b^7*c^2*d + 3*a^7*b^6*c*d^2 - a^8*b^5*d^3)*g
^7*x + (a^6*b^7*c^3 - 3*a^7*b^6*c^2*d + 3*a^8*b^5*c*d^2 - a^9*b^4*d^3)*g^7)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**7,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 3.75, size = 382, normalized size = 1.36

$$\frac{\left(600i\,Bb^2e^7\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{1440i\,(bxe+ae)Bbde^6\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{900i\,(bxe+ae)^2Bd^2e^5\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+600i\,Ab^2e^7+100i\,Bb^2e^7-\frac{1440i\,(bxe+ae)Abde^6}{dx+c}-\frac{288i\,(bxe+ae)Bbde^6}{dx+c}+\frac{900i\,(bxe+ae)^2Ad^2e^5}{(dx+c)^2}+\frac{225i\,(bxe+ae)^2Bd^2e^5}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{3600\left(\frac{(bxe+ae)^6b^2c^2g^7}{(dx+c)^6}-\frac{2\,(bxe+ae)^6abcdg^7}{(dx+c)^6}+\frac{(bxe+ae)^6a^2d^2g^7}{(dx+c)^6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7,x, algor
ithm="giac")
```

```
[Out] 1/3600*(600*I*B*b^2*e^7*log((b*x*e + a*e)/(d*x + c)) - 1440*I*(b*x*e + a*e)
*B*b*d*e^6*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 900*I*(b*x*e + a*e)^2*B
*d^2*e^5*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 600*I*A*b^2*e^7 + 100*I
*B*b^2*e^7 - 1440*I*(b*x*e + a*e)*A*b*d*e^6/(d*x + c) - 288*I*(b*x*e + a*e)
*B*b*d*e^6/(d*x + c) + 900*I*(b*x*e + a*e)^2*A*d^2*e^5/(d*x + c)^2 + 225*I*
(b*x*e + a*e)^2*B*d^2*e^5/(d*x + c)^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) -
 a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^6*b^2*c^2*g^7/(d*x + c)^
6 - 2*(b*x*e + a*e)^6*a*b*c*d*g^7/(d*x + c)^6 + (b*x*e + a*e)^6*a^2*d^2*g^7
/(d*x + c)^6)
```

Mupad [B]
time = 9.73, size = 1396, normalized size = 4.97

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x))))/(a*g + b*g*x)^7,
x)

[Out] (B*d^6*i^3*atanh((60*b^7*c^3*g^7 + 60*a^3*b^4*d^3*g^7 - 60*a*b^6*c^2*d*g^7
- 60*a^2*b^5*c*d^2*g^7)/(60*b^4*g^7*(a*d - b*c)^3) + (2*b*d*x*(a^2*d^2 + b^
2*c^2 - 2*a*b*c*d))/(a*d - b*c)^3))/(30*b^4*g^7*(a*d - b*c)^3) - (log((e*(a
 + b*x))/(c + d*x))*(x^2*(b*(b*((B*a*d^3*i^3)/(60*b^5*g^7) + (B*c*d^2*i^3)/
(20*b^4*g^7)) + (B*a*d^3*i^3)/(15*b^4*g^7) + (B*c*d^2*i^3)/(5*b^3*g^7)) + (
B*a*d^3*i^3)/(6*b^3*g^7) + (B*c*d^2*i^3)/(2*b^2*g^7)) + x*(b*(a*((B*a*d^3*i
^3)/(60*b^5*g^7) + (B*c*d^2*i^3)/(20*b^4*g^7)) + (B*c^2*d*i^3)/(10*b^3*g^7)
) + a*(b*((B*a*d^3*i^3)/(60*b^5*g^7) + (B*c*d^2*i^3)/(20*b^4*g^7)) + (B*a*d
^3*i^3)/(15*b^4*g^7) + (B*c*d^2*i^3)/(5*b^3*g^7)) + (B*c^2*d*i^3)/(2*b^2*g^
7)) + a*(a*((B*a*d^3*i^3)/(60*b^5*g^7) + (B*c*d^2*i^3)/(20*b^4*g^7)) + (B*c
^2*d*i^3)/(10*b^3*g^7)) + (B*c^3*i^3)/(6*b^2*g^7) + (B*d^3*i^3*x^3)/(3*b^2*
g^7)))/(6*a^5*x + a^6/b + b^5*x^6 + 15*a^4*b*x^2 + 6*a*b^4*x^5 + 20*a^3*b^2
*x^3 + 15*a^2*b^3*x^4) - ((60*A*a^5*d^5*i^3 + 600*A*b^5*c^5*i^3 + 37*B*a^5*
d^5*i^3 + 100*B*b^5*c^5*i^3 + 60*A*a^2*b^3*c^3*d^2*i^3 + 60*A*a^3*b^2*c^2*d
^3*i^3 + 37*B*a^2*b^3*c^3*d^2*i^3 + 37*B*a^3*b^2*c^2*d^3*i^3 - 840*A*a*b^4*
c^4*d*i^3 + 60*A*a^4*b*c*d^4*i^3 - 188*B*a*b^4*c^4*d*i^3 + 37*B*a^4*b*c*d^4
*i^3)/(60*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (x^2*(60*A*a^3*b^2*d^5*i^3 + 3
7*B*a^3*b^2*d^5*i^3 + 180*A*b^5*c^3*d^2*i^3 + 19*B*b^5*c^3*d^2*i^3 - 300*A*
a*b^4*c^2*d^3*i^3 + 60*A*a^2*b^3*c*d^4*i^3 - 53*B*a*b^4*c^2*d^3*i^3 + 37*B*
a^2*b^3*c*d^4*i^3))/(4*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (x*(60*A*a^4*b*d^
5*i^3 + 37*B*a^4*b*d^5*i^3 + 360*A*b^5*c^4*d*i^3 + 52*B*b^5*c^4*d*i^3 - 540
*A*a*b^4*c^3*d^2*i^3 + 60*A*a^3*b^2*c*d^4*i^3 - 113*B*a*b^4*c^3*d^2*i^3 + 3
7*B*a^3*b^2*c*d^4*i^3 + 60*A*a^2*b^3*c^2*d^3*i^3 + 37*B*a^2*b^3*c^2*d^3*i^3
))/(10*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (x^3*(60*A*a^2*b^3*d^5*i^3 + 37*B
*a^2*b^3*d^5*i^3 + 60*A*b^5*c^2*d^3*i^3 + B*b^5*c^2*d^3*i^3 - 120*A*a*b^4*c
*d^4*i^3 - 8*B*a*b^4*c*d^4*i^3))/(3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (d*x
^4*(11*B*a*b^4*d^4*i^3 - B*b^5*c*d^3*i^3))/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*
d)) + (B*b^5*d^5*i^3*x^5)/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))/(60*a^6*b^4*g^7
+ 60*b^10*g^7*x^6 + 360*a^5*b^5*g^7*x + 360*a*b^9*g^7*x^5 + 900*a^4*b^6*g^7
*x^2 + 1200*a^3*b^7*g^7*x^3 + 900*a^2*b^8*g^7*x^4)
```

3.31 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=252

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

```
[Out] 1/3*g^3*(b*x+a)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/d/i-1/6*(-a*d+b*c)*g^3*(b*x+a
)^2*(3*A+B+3*B*ln(e*(b*x+a)/(d*x+c)))/d^2/i+1/6*(-a*d+b*c)^2*g^3*(b*x+a)*(6
*A+5*B+6*B*ln(e*(b*x+a)/(d*x+c)))/d^3/i+1/6*(-a*d+b*c)^3*g^3*ln((-a*d+b*c)/
b/(d*x+c))*(6*A+11*B+6*B*ln(e*(b*x+a)/(d*x+c)))/d^4/i+B*(-a*d+b*c)^3*g^3*po
lylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i
```

Rubi [A]
time = 0.22, antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 2384, 2354, 2438}

$$\frac{Bg^3(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i}+\frac{g^3(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+11B\right)}{6d^4i}+\frac{g^3(a+bx)(bc-ad)^2\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+5B\right)}{6d^3i}-\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right)+3A+B\right)}{6d^2i}+\frac{g^3(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3di}$$

Antiderivative was successfully verified.

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

```
[Out] (g^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*d*i) - ((b*c - a*
d)*g^3*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(6*d^2*i)
+ ((b*c - a*d)^2*g^3*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x)
]))/(6*d^3*i) + ((b*c - a*d)^3*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(6*A + 11
*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(6*d^4*i) + (B*(b*c - a*d)^3*g^3*Po
lyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i)
```

Rule 2354

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

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{31c+31dx}\,dx = \int \left(\frac{b(bc-ad)^2g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{31d^3} + \frac{(-bc+ad)^3g^3\left(A+\right.}{d^3(31c+}\right.$$

$$= \frac{(bg)\int (ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{31d} - \frac{(b(bc-ad)g^2)\int (}{}$$

$$= \frac{Ab(bc-ad)^2g^3x}{31d^3} - \frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{62d^2}$$

$$= \frac{Ab(bc-ad)^2g^3x}{31d^3} + \frac{B(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{31d^3} - \frac{(bc-}{}$$

$$= \frac{Ab(bc-ad)^2g^3x}{31d^3} + \frac{B(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{31d^3} - \frac{(bc-}{}$$

$$= \frac{Ab(bc-ad)^2g^3x}{31d^3} + \frac{5bB(bc-ad)^2g^3x}{186d^3} - \frac{B(bc-ad)g^3(a+bx)^2}{186d^2}$$

$$= \frac{Ab(bc-ad)^2g^3x}{31d^3} + \frac{5bB(bc-ad)^2g^3x}{186d^3} - \frac{B(bc-ad)g^3(a+bx)^2}{186d^2}$$

$$= \frac{Ab(bc-ad)^2g^3x}{31d^3} + \frac{5bB(bc-ad)^2g^3x}{186d^3} - \frac{B(bc-ad)g^3(a+bx)^2}{186d^2}$$

$$= \frac{Ab(bc-ad)^2g^3x}{31d^3} + \frac{5bB(bc-ad)^2g^3x}{186d^3} - \frac{B(bc-ad)g^3(a+bx)^2}{186d^2}$$

Mathematica [**A**]
time = 0.20, size = 354, normalized size = 1.40

$$\frac{g^3\left(6Abd(bc-ad)^2x+6Bd(bc-ad)^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+3d^2(-bc+ad)(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+2d^3(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-6B(bc-ad)^3\log(c+dx)+B(bc-ad)\left(2bd(bc-ad)x-d^2(a+bx)^2-2(bc-ad)^2\log(c+dx)\right)+3B(bc-ad)^2(bdx+(-bc+ad)\log(c+dx))-6(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(i(c+dx))+3B(bc-ad)^3\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(i(c+dx))\right)\log(i(c+dx))+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{6d^4i}$$

Antiderivative was successfully verified.

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

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

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 3534 vs. $2(244) = 488$.
time = 1.65, size = 3535, normalized size = 14.03

method	result	size
derivativedivides	Expression too large to display	3535
default	Expression too large to display	3535
risch	Expression too large to display	3731

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*c^2-1/6*B*g^3*e/i*b^2/(b*e-(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*d)^2*a^2-11/3*B/d*g^3/e/i*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x
+c))*d)*a*b*c-2*B/d*g^3/e/i*dilog(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)/b
/e)*a*b*c+B/d^2*g^3/e/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(-b*e+(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*d)/b/e)*b^2*c^2-B*d^2*g^3/i*b*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
d)^3*a^2+1/3*B*d*g^3/e/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*b^2*c^2+2*B*d*g^3/i*b
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c-2*B/d*g^3/e/i*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*ln(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)/b/e)*a*b*c-2*B*g^3*e/i*b^
3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c+B*d*g^3*e/i*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3
*a^2+3/2*B*g^3/e/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*b^2*c^2+3*B*d*g^3/e/i*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*d)*a^2-2*A/d*g^3/e/i*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
d)*a*b*c+3*A/d*g^3*e/i*b^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a*c-2/3*
A/d*g^3*e^2/i*b^4/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*c-3*B/d*g^3/i*b
^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*d)^2*c^2+3/2*B*d^2*g^3/e/i*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*d)^2*a^2-3*B*d*g^3/i*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a^2+1/3*B/d*g^3*e/i*b^3/
(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a*c+1/3*B*d^3*g^3/e/i*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*d)^3*a^2+6*B*g^3/i*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^2*a*c+7/6*B*g^3/
i*b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^2+B*g^3/e/i*dilog(-(-b*e+(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*d)/b/e)*a^2-3*B*d*g^3/e/i*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d
)^2*a*b*c-2/3*B*d^2*g^3/e/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c
)*e/d/(d*x+c))^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a*b*c+1/3*A*g^3*e^
2/i*b^3/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)^3*a^2+B/d*g^3*e/i*b^4*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*d)^3*c^2-6*B*g^3/e/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a*b*c+3*B/d*g^
3/e/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*b^2*c^2+11/6*B*g^3/e/i*ln(b*e-(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*d)*a^2+3*A*g^3/i*b/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^
2+A*g^3/e/i*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)*a^2)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 694 vs. $2(233) = 466$.

time = 0.35, size = 694, normalized size = 2.75

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 3*A*a^2*b*g^3*(-I*x/d + I*c*log(d*x + c)/d^2) - 1/6*A*b^3*g^3*(-6*I*c^3*log
(d*x + c)/d^4 + I*(2*d^2*x^3 - 3*c*d*x^2 + 6*c^2*x)/d^3) - 3/2*A*a*b^2*g^3*
(2*I*c^2*log(d*x + c)/d^3 + I*(d*x^2 - 2*c*x)/d^2) - I*A*a^3*g^3*log(I*d*x
+ I*c)/d - (-I*b^3*c^3*g^3 + 3*I*a*b^2*c^2*d*g^3 - 3*I*a^2*b*c*d^2*g^3 + I*
a^3*d^3*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d
*x + a*d)/(b*c - a*d)))*B/d^4 - 1/6*(-17*I*b^3*c^3*g^3 + 45*I*a*b^2*c^2*d*g
^3 - 36*I*a^2*b*c*d^2*g^3 + 6*I*a^3*d^3*g^3)*B*log(d*x + c)/d^4 + 1/6*(-2*I
*B*b^3*d^3*g^3*x^3 - 2*(-2*I*b^3*c*d^2*g^3 + 5*I*a*b^2*d^3*g^3)*B*x^2 - 3*(
I*b^3*c^3*g^3 - 3*I*a*b^2*c^2*d*g^3 + 3*I*a^2*b*c*d^2*g^3 - I*a^3*d^3*g^3)*
B*log(d*x + c)^2 + (-11*I*b^3*c^2*d*g^3 + 30*I*a*b^2*c*d^2*g^3 - 25*I*a^2*b
*d^3*g^3)*B*x + (-2*I*B*b^3*d^3*g^3*x^3 - 3*(-I*b^3*c*d^2*g^3 + 3*I*a*b^2*d
^3*g^3)*B*x^2 - 6*(I*b^3*c^2*d*g^3 - 3*I*a*b^2*c*d^2*g^3 + 3*I*a^2*b*d^3*g^
3)*B*x + (-6*I*a*b^2*c^2*d*g^3 + 15*I*a^2*b*c*d^2*g^3 - 11*I*a^3*d^3*g^3)*B
)*log(b*x + a) + (2*I*B*b^3*d^3*g^3*x^3 - 3*(I*b^3*c*d^2*g^3 - 3*I*a*b^2*d^
3*g^3)*B*x^2 - 6*(-I*b^3*c^2*d*g^3 + 3*I*a*b^2*c*d^2*g^3 - 3*I*a^2*b*d^3*g^
3)*B*x)*log(d*x + c))/d^4
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{g^3\left(\int\frac{Aa^3}{c+dx}\,dx+\int\frac{Ab^3x^3}{c+dx}\,dx+\int\frac{Ba^3\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx+\int\frac{3Aab^2x^2}{c+dx}\,dx+\int\frac{3Aa^2bx}{c+dx}\,dx+\int\frac{Bb^3x^3\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx+\int\frac{3Bab^2x^2\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx+\int\frac{3Ba^2bx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] g**3*(Integral(A*a**3/(c + d*x), x) + Integral(A*b**3*x**3/(c + d*x), x) +
Integral(B*a**3*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(c + d*x), x) + Integr
al(3*A*a*b**2*x**2/(c + d*x), x) + Integral(3*A*a**2*b*x/(c + d*x), x) + In
tegral(B*b**3*x**3*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(c + d*x), x) + Int
egral(3*B*a*b**2*x**2*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(c + d*x), x) +
Integral(3*B*a**2*b*x*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(c + d*x), x))/i
```

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5565 vs. $2(233) = 466$.
time = 77.49, size = 5565, normalized size = 22.08

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/120*(6*I*B*b^11*c^6*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 36*I*
B*a*b^10*c^5*d*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 90*I*B*a^2*b
^9*c^4*d^2*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 120*I*B*a^3*b^8*
c^3*d^3*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 90*I*B*a^4*b^7*c^2*
d^4*g^3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 36*I*B*a^5*b^6*c*d^5*g^
3*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 6*I*B*a^6*b^5*d^6*g^3*e^6*log
(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 30*I*(b*x*e + a*e)*B*b^10*c^6*d*g^3*e^
5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 180*I*(b*x*e + a*e)*B*a
*b^9*c^5*d^2*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 450*
I*(b*x*e + a*e)*B*a^2*b^8*c^4*d^3*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x +
 c))/(d*x + c) + 600*I*(b*x*e + a*e)*B*a^3*b^7*c^3*d^4*g^3*e^5*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 450*I*(b*x*e + a*e)*B*a^4*b^6*c^2*d^5
*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 180*I*(b*x*e + a
*e)*B*a^5*b^5*c*d^6*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
 - 30*I*(b*x*e + a*e)*B*a^6*b^4*d^7*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x
 + c))/(d*x + c) + 60*I*(b*x*e + a*e)^2*B*b^9*c^6*d^2*g^3*e^4*log(-b*e + (b
*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 360*I*(b*x*e + a*e)^2*B*a*b^8*c^5*d^
3*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 900*I*(b*x*e
+ a*e)^2*B*a^2*b^7*c^4*d^4*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^2 - 1200*I*(b*x*e + a*e)^2*B*a^3*b^6*c^3*d^5*g^3*e^4*log(-b*e + (b*
x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 900*I*(b*x*e + a*e)^2*B*a^4*b^5*c^2*d
^6*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 360*I*(b*x*e
 + a*e)^2*B*a^5*b^4*c*d^7*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*
x + c)^2 + 60*I*(b*x*e + a*e)^2*B*a^6*b^3*d^8*g^3*e^4*log(-b*e + (b*x*e + a
*e)*d/(d*x + c))/(d*x + c)^2 - 60*I*(b*x*e + a*e)^3*B*b^8*c^6*d^3*g^3*e^3*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 360*I*(b*x*e + a*e)^3*B*
a*b^7*c^5*d^4*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 9
00*I*(b*x*e + a*e)^3*B*a^2*b^6*c^4*d^5*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(
```

```
d*x + c))/(d*x + c)^3 + 1200*I*(b*x*e + a*e)^3*B*a^3*b^5*c^3*d^6*g^3*e^3*lo
g(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 900*I*(b*x*e + a*e)^3*B*a
^4*b^4*c^2*d^7*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 +
360*I*(b*x*e + a*e)^3*B*a^5*b^3*c*d^8*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d
*x + c))/(d*x + c)^3 - 60*I*(b*x*e + a*e)^3*B*a^6*b^2*d^9*g^3*e^3*log(-b*e
+ (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 30*I*(b*x*e + a*e)^4*B*b^7*c^6*d
^4*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 180*I*(b*x*e
 + a*e)^4*B*a*b^6*c^5*d^5*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*
x + c)^4 + 450*I*(b*x*e + a*e)^4*B*a^2*b^5*c^4*d^6*g^3*e^2*log(-b*e + (b*x*
e + a*e)*d/(d*x + c))/(d*x + c)^4 - 600*I*(b*x*e + a*e)^4*B*a^3*b^4*c^3*d^7
*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 450*I*(b*x*e +
 a*e)^4*B*a^4*b^3*c^2*d^8*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*
x + c)^4 - 180*I*(b*x*e + a*e)^4*B*a^5*b^2*c*d^9*g^3*e^2*log(-b*e + (b*x*e
+ a*e)*d/(d*x + c))/(d*x + c)^4 + 30*I*(b*x*e + a*e)^4*B*a^6*b*d^10*g^3*e^2
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 6*I*(b*x*e + a*e)^5*B*
b^6*c^6*d^5*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 36*I*
(b*x*e + a*e)^5*B*a*b^5*c^5*d^6*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))
/(d*x + c)^5 - 90*I*(b*x*e + a*e)^5*B*a^2*b^4*c^4*d^7*g^3*e*log(-b*e + (b*x
*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 120*I*(b*x*e + a*e)^5*B*a^3*b^3*c^3*d^
8*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 90*I*(b*x*e + a
*e)^5*B*a^4*b^2*c^2*d^9*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x +
c)^5 + 36*I*(b*x*e + a*e)^5*B*a^5*b*c*d^10*g^3*e*log(-b*e + (b*x*e + a*e)*d
/(d*x + c))/(d*x + c)^5 - 6*I*(b*x*e + a*e)^5*B*a^6*d^11*g^3*e*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 30*I*(b*x*e + a*e)^4*B*b^7*c^6*d^4*
g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 180*I*(b*x*e + a*e)^4*B*
a*b^6*c^5*d^5*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 450*I*(b*x
*e + a*e)^4*B*a^2*b^5*c^4*d^6*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c
)^4 + 600*I*(b*x*e + a*e)^4*B*a^3*b^4*c^3*d^7*g^3*e^2*log((b*x*e + a*e)/(d*
x + c))/(d*x + c)^4 - 450*I*(b*x*e + a*e)^4*B*a^4*b^3*c^2*d^8*g^3*e^2*log((
b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 180*I*(b*x*e + a*e)^4*B*a^5*b^2*c*d^9
*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 30*I*(b*x*e + a*e)^4*B*
a^6*b*d^10*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 6*I*(b*x*e +
a*e)^5*B*b^6*c^6*d^5*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^5 - 36*I*
(b*x*e + a*e)^5*B*a*b^5*c^5*d^6*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c
)^5 + 90*I*(b*x*e + a*e)^5*B*a^2*b^4*c^4*d^7*g^3*e*log((b*x*e + a*e)/(d*x +
 c))/(d*x + c)^5 - 120*I*(b*x*e + a*e)^5*B*a^3*b^3*c^3*d^8*g^3*e*log((b*x*e
 + a*e)/(d*x + c))/(d*x + c)^5 + 90*I*(b*x*e + a*e)^5*B*a^4*b^2*c^2*d^9*g^3
*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^5 - 36*I*(b*x*e + a*e)^5*B*a^5*b*
c*d^10*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x ...
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

3.32 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=198

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

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

Rubi [A]
time = 0.16, antiderivative size = 198, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 2384, 2354, 2438}

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

Antiderivative was successfully verified.

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

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

Rule 2354

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

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{32c+32dx}\,dx = \int \left(-\frac{b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{32d^2}+\frac{(bc-ad)^2g^2\left(A+\right.}{d^2(32c+}\right.$$

$$= \frac{(bg)\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{32d} - \frac{(b(bc-ad)g^2)\int \left(\right.}{}$$

$$= -\frac{Ab(bc-ad)g^2x}{32d^2}+\frac{g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{64d}+\frac{(bc-}{}$$

$$= -\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{32d^2}+\frac{g^2(a}{}$$

$$= -\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{32d^2}+\frac{g^2(a}{}$$

$$= -\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{bB(bc-ad)g^2x}{64d^2}-\frac{B(bc-ad)g^2(a+bx)\log}{32d^2}$$

$$= -\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{bB(bc-ad)g^2x}{64d^2}-\frac{B(bc-ad)g^2(a+bx)\log}{32d^2}$$

$$= -\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{bB(bc-ad)g^2x}{64d^2}-\frac{B(bc-ad)g^2(a+bx)\log}{32d^2}$$

$$= -\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{bB(bc-ad)g^2x}{64d^2}-\frac{B(bc-ad)g^2(a+bx)\log}{32d^2}$$

Mathematica [A]

time = 0.13, size = 254, normalized size = 1.28

$$\frac{g^2\left(-2Abd(bc-ad)x+2Bd(-bc+ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+d^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+2B(bc-ad)^2\log(c+dx)-B(bc-ad)(bdx+(-bc+ad)\log(c+dx))+2(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(i(c+dx))-B(bc-ad)^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(i(c+dx))\right)\log(i(c+dx))+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{2d^3i}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1434 vs. $2(192) = 384$.
time = 1.44, size = 1435, normalized size = 7.25

method	result	size
derivativedivides	Expression too large to display	1435
default	Expression too large to display	1435
risch	Expression too large to display	1998

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 425 vs. $2(182) = 364$.
time = 0.35, size = 425, normalized size = 2.15

$$2\,Aabg^2\left(-\frac{i\,x}{d}+\frac{i\,c\log\left(dx+c\right)}{d^2}\right)-\frac{1}{2}\,Ab^2g^2\left(\frac{2i\,c^2\log\left(dx+c\right)}{d^3}+\frac{i\left(dx^2-2\,cx\right)}{d^2}\right)-\frac{i\,Aa^2g^2\log\left(i\,dx+i\,c\right)}{d}-\frac{i\left(b^2c^2g^2-2\,abcdg^2+a^2d^2g^2\right)\left(\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{d^3}-\frac{i\left(5\,b^2c^2g^2-8\,abcdg^2+2\,a^2d^2g^2\right)B\log\left(dx+c\right)}{2\,d^3}+\frac{-i\,Bb^2d^2g^2x^2+\left(i\,b^2c^2g^2-2i\,abcdg^2+i\,a^2d^2g^2\right)B\log\left(dx+c\right)^2+\left(3i\,b^2cdg^2-5i\,abd^2g^2\right)Bx+\left(-i\,Bb^2d^2g^2x^2-2\left(-i\,b^2cdg^2+2i\,abd^2g^2\right)Bx+\left(2i\,abcdg^2-3i\,a^2d^2g^2\right)B\right)\log\left(bx+a\right)+\left(i\,Bb^2d^2g^2x^2-2\left(i\,b^2cdg^2-2i\,abd^2g^2\right)Bx\right)\log\left(dx+c\right)}{2\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2*A*a*b*g^2*(-I*x/d + I*c*log(d*x + c)/d^2) - 1/2*A*b^2*g^2*(2*I*c^2*log(d*
x + c)/d^3 + I*(d*x^2 - 2*c*x)/d^2) - I*A*a^2*g^2*log(I*d*x + I*c)/d - I*(b
^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*(log(b*x + a)*log((b*d*x + a*d)/(
b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/d^3 - 1/2*I*(5*b^2*c
^2*g^2 - 8*a*b*c*d*g^2 + 2*a^2*d^2*g^2)*B*log(d*x + c)/d^3 + 1/2*(-I*B*b^2*
d^2*g^2*x^2 + (I*b^2*c^2*g^2 - 2*I*a*b*c*d*g^2 + I*a^2*d^2*g^2)*B*log(d*x +
 c)^2 + (3*I*b^2*c*d*g^2 - 5*I*a*b*d^2*g^2)*B*x + (-I*B*b^2*d^2*g^2*x^2 - 2
*(-I*b^2*c*d*g^2 + 2*I*a*b*d^2*g^2)*B*x + (2*I*a*b*c*d*g^2 - 3*I*a^2*d^2*g^
2)*B)*log(b*x + a) + (I*B*b^2*d^2*g^2*x^2 - 2*(I*b^2*c*d*g^2 - 2*I*a*b*d^2*
g^2)*B*x)*log(d*x + c))/d^3
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{g^2\left(\int\frac{Aa^2}{c+dx}\,dx+\int\frac{Ab^2x^2}{c+dx}\,dx+\int\frac{Ba^2\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx+\int\frac{2Aabx}{c+dx}\,dx+\int\frac{Bb^2x^2\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx+\int\frac{2Babx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3913 vs. $2(182) = 364$.
time = 67.51, size = 3913, normalized size = 19.76

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(-2*I*B*b^9*c^5*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 10*I*B
*a*b^8*c^4*d*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 20*I*B*a^2*b^7
*c^3*d^2*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 20*I*B*a^3*b^6*c^2
*d^3*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 10*I*B*a^4*b^5*c*d^4*g
^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 2*I*B*a^5*b^4*d^5*g^2*e^5*lo
g(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 8*I*(b*x*e + a*e)*B*b^8*c^5*d*g^2*e^4
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 40*I*(b*x*e + a*e)*B*a*b
^7*c^4*d^2*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 80*I*(
b*x*e + a*e)*B*a^2*b^6*c^3*d^3*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)
)/(d*x + c) - 80*I*(b*x*e + a*e)*B*a^3*b^5*c^2*d^4*g^2*e^4*log(-b*e + (b*x*
e + a*e)*d/(d*x + c))/(d*x + c) + 40*I*(b*x*e + a*e)*B*a^4*b^4*c*d^5*g^2*e^
4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 8*I*(b*x*e + a*e)*B*a^5
*b^3*d^6*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 12*I*(b*
x*e + a*e)^2*B*b^7*c^5*d^2*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^2 + 60*I*(b*x*e + a*e)^2*B*a*b^6*c^4*d^3*g^2*e^3*log(-b*e + (b*x*e
+ a*e)*d/(d*x + c))/(d*x + c)^2 - 120*I*(b*x*e + a*e)^2*B*a^2*b^5*c^3*d^4*g
^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 120*I*(b*x*e + a
*e)^2*B*a^3*b^4*c^2*d^5*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
+ c)^2 - 60*I*(b*x*e + a*e)^2*B*a^4*b^3*c*d^6*g^2*e^3*log(-b*e + (b*x*e + a
*e)*d/(d*x + c))/(d*x + c)^2 + 12*I*(b*x*e + a*e)^2*B*a^5*b^2*d^7*g^2*e^3*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 8*I*(b*x*e + a*e)^3*B*b^
6*c^5*d^3*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 40*I*
(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c
))/(d*x + c)^3 + 80*I*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g^2*e^2*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 80*I*(b*x*e + a*e)^3*B*a^3*b^3*c^2
*d^6*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 40*I*(b*x*
```

```
e + a*e)^3*B*a^4*b^2*c*d^7*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^3 - 8*I*(b*x*e + a*e)^3*B*a^5*b*d^8*g^2*e^2*log(-b*e + (b*x*e + a*e
)*d/(d*x + c))/(d*x + c)^3 - 2*I*(b*x*e + a*e)^4*B*b^5*c^5*d^4*g^2*e*log(-b
*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 10*I*(b*x*e + a*e)^4*B*a*b^4*
c^4*d^5*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 20*I*(b*x
*e + a*e)^4*B*a^2*b^3*c^3*d^6*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(
d*x + c)^4 + 20*I*(b*x*e + a*e)^4*B*a^3*b^2*c^2*d^7*g^2*e*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^4 - 10*I*(b*x*e + a*e)^4*B*a^4*b*c*d^8*g^2*e
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 2*I*(b*x*e + a*e)^4*B*
a^5*d^9*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 8*I*(b*x*
e + a*e)^3*B*b^6*c^5*d^3*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 +
 40*I*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/
(d*x + c)^3 - 80*I*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g^2*e^2*log((b*x*e + a
*e)/(d*x + c))/(d*x + c)^3 + 80*I*(b*x*e + a*e)^3*B*a^3*b^3*c^2*d^6*g^2*e^2
*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 40*I*(b*x*e + a*e)^3*B*a^4*b^2*
c*d^7*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 8*I*(b*x*e + a*e)^
3*B*a^5*b*d^8*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 2*I*(b*x*e
 + a*e)^4*B*b^5*c^5*d^4*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 10
*I*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x
+ c)^4 + 20*I*(b*x*e + a*e)^4*B*a^2*b^3*c^3*d^6*g^2*e*log((b*x*e + a*e)/(d*
x + c))/(d*x + c)^4 - 20*I*(b*x*e + a*e)^4*B*a^3*b^2*c^2*d^7*g^2*e*log((b*x
*e + a*e)/(d*x + c))/(d*x + c)^4 + 10*I*(b*x*e + a*e)^4*B*a^4*b*c*d^8*g^2*e
*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 2*I*(b*x*e + a*e)^4*B*a^5*d^9*g
^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 2*I*A*b^9*c^5*g^2*e^5 - I*B
*b^9*c^5*g^2*e^5 + 10*I*A*a*b^8*c^4*d*g^2*e^5 + 5*I*B*a*b^8*c^4*d*g^2*e^5 -
 20*I*A*a^2*b^7*c^3*d^2*g^2*e^5 - 10*I*B*a^2*b^7*c^3*d^2*g^2*e^5 + 20*I*A*a
^3*b^6*c^2*d^3*g^2*e^5 + 10*I*B*a^3*b^6*c^2*d^3*g^2*e^5 - 10*I*A*a^4*b^5*c*
d^4*g^2*e^5 - 5*I*B*a^4*b^5*c*d^4*g^2*e^5 + 2*I*A*a^5*b^4*d^5*g^2*e^5 + I*B
*a^5*b^4*d^5*g^2*e^5 + 8*I*(b*x*e + a*e)*A*b^8*c^5*d*g^2*e^4/(d*x + c) + 2*
I*(b*x*e + a*e)*B*b^8*c^5*d*g^2*e^4/(d*x + c) - 40*I*(b*x*e + a*e)*A*a*b^7*
c^4*d^2*g^2*e^4/(d*x + c) - 10*I*(b*x*e + a*e)*B*a*b^7*c^4*d^2*g^2*e^4/(d*x
 + c) + 80*I*(b*x*e + a*e)*A*a^2*b^6*c^3*d^3*g^2*e^4/(d*x + c) + 20*I*(b*x*
e + a*e)*B*a^2*b^6*c^3*d^3*g^2*e^4/(d*x + c) - 80*I*(b*x*e + a*e)*A*a^3*b^5
*c^2*d^4*g^2*e^4/(d*x + c) - 20*I*(b*x*e + a*e)*B*a^3*b^5*c^2*d^4*g^2*e^4/(
d*x + c) + 40*I*(b*x*e + a*e)*A*a^4*b^4*c*d^5*g^2*e^4/(d*x + c) + 10*I*(b*x
*e + a*e)*B*a^4*b^4*c*d^5*g^2*e^4/(d*x + c) - 8*I*(b*x*e + a*e)*A*a^5*b^3*d
^6*g^2*e^4/(d*x + c) - 2*I*(b*x*e + a*e)*B*a^5*b^3*d^6*g^2*e^4/(d*x + c) -
12*I*(b*x*e + a*e)^2*A*b^7*c^5*d^2*g^2*e^3/(d*x + c)^2 + I*(b*x*e + a*e)^2*
B*b^7*c^5*d^2*g^2*e^3/(d*x + c)^2 + 60*I*(b*x*e + a*e)^2*A*a*b^6*c^4*d^3*g^
2*e^3/(d*x + c)^2 - 5*I*(b*x*e + a*e)^2*B*a*b^6*c^4*d^3*g^2*e^3/(d*x + c)^2
 - 120*I*(b*x*e + a*e)^2*A*a^2*b^5*c^3*d^4*g^2*...
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a\,g + b\,g\,x)^2 \left(A + B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{c\,i + d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

3.33 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=125

$$\frac{g(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{di}+\frac{(bc-ad)g\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2i}+\frac{B(bc-ad)g\mathrm{Li}_2\left(\frac{d(a$$

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

Rubi [A]
time = 0.09, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2562, 2384, 2354, 2438}

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

Antiderivative was successfully verified.

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

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

Rule 2354

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

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{33c+33dx}\,dx = \int \left(\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{33d} + \frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+b\cdots}{c+dx}\right.\right.}{33d(c+dx)}\right.$$

$$= \frac{(bg)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{33d} - \frac{((bc-ad)g)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right.}{c+dx}}{33d}$$

$$= \frac{Abgx}{33d} - \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{33d^2} + \frac{(bBg)\cdots}{}$$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a\cdots}{c+\cdots}\right.\right.}{33d^2}$$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} - $$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} - $$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} + $$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} + $$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} + $$

Mathematica [A]
time = 0.08, size = 162, normalized size = 1.30

$$\frac{g\left(2Abdx+2Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)-2B(bc-ad)\log(c+dx)-2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)+B(bc-ad)\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{2d^2i}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 379 vs. $2(125) = 250$.
time = 1.33, size = 380, normalized size = 3.04

method	result
derivativedivides	$-\frac{e(ad-cb)\left(\frac{gA\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{ei}+\frac{gAb}{i\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}+\frac{gB\,\mathrm{dilog}\left(-\frac{-be+\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d}{be}\right)}{ei}+\frac{gB\ln\left(\frac{be}{d}+\frac{(a}{d(}\right.}{}\right.}{d^2}$
default	$-\frac{e(ad-cb)\left(\frac{gA\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{ei}+\frac{gAb}{i\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}+\frac{gB\,\mathrm{dilog}\left(-\frac{-be+\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d}{be}\right)}{ei}+\frac{gB\ln\left(\frac{be}{d}+\frac{(a}{d(}\right.}{}\right.}{d^2}$
risch	$\frac{gAbx}{id}+\frac{gA\ln(dx+c)a}{id}-\frac{gA\ln(dx+c)cb}{i\,d^2}-\frac{gB\ln\left(-be+\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)a}{id}+\frac{gBb\ln\left(-be+\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)c}{i\,d^2}+$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A]
time = 0.33, size = 201, normalized size = 1.61

$$Abg\left(-\frac{i\,x}{d}+\frac{i\,c\log\left(dx+c\right)}{d^2}\right)-\frac{i\,Aag\log\left(i\,dx+i\,c\right)}{d}-\frac{\left(-i\,bcg+i\,adg\right)\left(\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{d^2}-\frac{\left(-2i\,bcg+i\,adg\right)B\log\left(dx+c\right)}{d^2}+\frac{2i\,Bbdgx\log\left(dx+c\right)-2i\,Bbdgx+\left(-i\,bcg+i\,adg\right)B\log\left(dx+c\right)^2-2\left(i\,Bbdgx+i\,Badg\right)\log\left(bx+a\right)}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{g\left(\int \frac{Aa}{c+dx}\,dx + \int \frac{Abx}{c+dx}\,dx + \int \frac{Ba\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx + \int \frac{Bbx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2364 vs. 2(120) = 240.
time = 49.16, size = 2364, normalized size = 18.91

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*(I*B*b^7*c^4*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 4*I*B*a*b^6*
c^3*d*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 6*I*B*a^2*b^5*c^2*d^2*g
```

```
*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 4*I*B*a^3*b^4*c*d^3*g*e^4*log(
-b*e + (b*x*e + a*e)*d/(d*x + c)) + I*B*a^4*b^3*d^4*g*e^4*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c)) - 3*I*(b*x*e + a*e)*B*b^6*c^4*d*g*e^3*log(-b*e + (b*x*
e + a*e)*d/(d*x + c))/(d*x + c) + 12*I*(b*x*e + a*e)*B*a*b^5*c^3*d^2*g*e^3*
log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 18*I*(b*x*e + a*e)*B*a^2*
b^4*c^2*d^3*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 12*I*(b
*x*e + a*e)*B*a^3*b^3*c*d^4*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*
x + c) - 3*I*(b*x*e + a*e)*B*a^4*b^2*d^5*g*e^3*log(-b*e + (b*x*e + a*e)*d/(
d*x + c))/(d*x + c) + 3*I*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g*e^2*log(-b*e + (b
*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 12*I*(b*x*e + a*e)^2*B*a*b^4*c^3*d^3
*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 18*I*(b*x*e + a*
e)^2*B*a^2*b^3*c^2*d^4*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c
)^2 - 12*I*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*g*e^2*log(-b*e + (b*x*e + a*e)*d
/(d*x + c))/(d*x + c)^2 + 3*I*(b*x*e + a*e)^2*B*a^4*b*d^6*g*e^2*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - I*(b*x*e + a*e)^3*B*b^4*c^4*d^3*g*
e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 4*I*(b*x*e + a*e)^3*B
*a*b^3*c^3*d^4*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 6*I*
(b*x*e + a*e)^3*B*a^2*b^2*c^2*d^5*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))
/(d*x + c)^3 + 4*I*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g*e*log(-b*e + (b*x*e + a*
e)*d/(d*x + c))/(d*x + c)^3 - I*(b*x*e + a*e)^3*B*a^4*d^7*g*e*log(-b*e + (b
*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 3*I*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g*
e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 12*I*(b*x*e + a*e)^2*B*a*b^4
*c^3*d^3*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 18*I*(b*x*e + a*e
)^2*B*a^2*b^3*c^2*d^4*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 12*I
*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x +
c)^2 - 3*I*(b*x*e + a*e)^2*B*a^4*b*d^6*g*e^2*log((b*x*e + a*e)/(d*x + c))/(
d*x + c)^2 + I*(b*x*e + a*e)^3*B*b^4*c^4*d^3*g*e*log((b*x*e + a*e)/(d*x + c
))/(d*x + c)^3 - 4*I*(b*x*e + a*e)^3*B*a*b^3*c^3*d^4*g*e*log((b*x*e + a*e)/
(d*x + c))/(d*x + c)^3 + 6*I*(b*x*e + a*e)^3*B*a^2*b^2*c^2*d^5*g*e*log((b*x
*e + a*e)/(d*x + c))/(d*x + c)^3 - 4*I*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g*e*lo
g((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + I*(b*x*e + a*e)^3*B*a^4*d^7*g*e*lo
g((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + I*A*b^7*c^4*g*e^4 - 4*I*A*a*b^6*c^
3*d*g*e^4 + 6*I*A*a^2*b^5*c^2*d^2*g*e^4 - 4*I*A*a^3*b^4*c*d^3*g*e^4 + I*A*a
^4*b^3*d^4*g*e^4 - 3*I*(b*x*e + a*e)*A*b^6*c^4*d*g*e^3/(d*x + c) + I*(b*x*e
 + a*e)*B*b^6*c^4*d*g*e^3/(d*x + c) + 12*I*(b*x*e + a*e)*A*a*b^5*c^3*d^2*g*
e^3/(d*x + c) - 4*I*(b*x*e + a*e)*B*a*b^5*c^3*d^2*g*e^3/(d*x + c) - 18*I*(b
*x*e + a*e)*A*a^2*b^4*c^2*d^3*g*e^3/(d*x + c) + 6*I*(b*x*e + a*e)*B*a^2*b^4
*c^2*d^3*g*e^3/(d*x + c) + 12*I*(b*x*e + a*e)*A*a^3*b^3*c*d^4*g*e^3/(d*x +
c) - 4*I*(b*x*e + a*e)*B*a^3*b^3*c*d^4*g*e^3/(d*x + c) - 3*I*(b*x*e + a*e)*
A*a^4*b^2*d^5*g*e^3/(d*x + c) + I*(b*x*e + a*e)*B*a^4*b^2*d^5*g*e^3/(d*x +
c) - I*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g*e^2/(d*x + c)^2 + 4*I*(b*x*e + a*e)^
2*B*a*b^4*c^3*d^3*g*e^2/(d*x + c)^2 - 6*I*(b*x*e + a*e)^2*B*a^2*b^3*c^2*d^4
*g*e^2/(d*x + c)^2 + 4*I*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*g*e^2/(d*x + c)^2
- I*(b*x*e + a*e)^2*B*a^4*b*d^6*g*e^2/(d*x + c)^2)*(b*c/((b*c*e - a*d*e)*(b
*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))^2/(b^5*d^2*e^3 - 3*(b*x*e +
```

```
 a*e)*b^4*d^3*e^2/(d*x + c) + 3*(b*x*e + a*e)^2*b^3*d^4*e/(d*x + c)^2 - (b*
x*e + a*e)^3*b^2*d^5/(d*x + c)^3)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a\,g+b\,g\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

3.34 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ci+dix}\,dx$

Optimal. Leaf size=76

$$-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{di}-\frac{B\mathrm{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)}{di}$$

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

Rubi [A]
time = 0.15, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2544, 2458, 2378, 2370, 2352}

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

Antiderivative was successfully verified.

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

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

Rule 2352

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[(-e^(-1))*PolyLo
g[2, 1 - c*x], x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2370

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2378

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2458

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
```

```
[(g*(x/e))^q*((e*h - d*i)/e + i*(x/e))^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2544

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

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{34c+34dx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(34c+34dx}{e(a+bx)}}{34d}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(34c+34dx}{a+bx}}{34de}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} - \frac{B\int \left(\frac{be\log(34c+34dx)}{a+bx} - \frac{de\log(34c+34dx)}{c+dx}\right.}{34de}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} + \frac{1}{34}B\int \frac{\log(34c+34dx)}{c+dx}\,dx - \frac{(bB)}{}$$

$$= -\frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(34c+34dx)}{34d} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d}$$

$$= -\frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(34c+34dx)}{34d} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d}$$

$$= \frac{B\log^2(34(c+dx))}{68d} - \frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(34c+34dx)}{34d} + \frac{\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{3}$$

Mathematica [A]
time = 0.02, size = 95, normalized size = 1.25

$$\frac{\log(i(c+dx))\left(2A-2B\log\left(\frac{d(a+bx)}{-bc+ad}\right)+2B\log\left(\frac{e(a+bx)}{c+dx}\right)+B\log(i(c+dx))\right)-2B\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)}{2di}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 221 vs. $2(76) = 152$.
time = 1.32, size = 222, normalized size = 2.92

method	result
risch	$\frac{A\ln(dx+c)}{id} - \frac{B\,\mathrm{dilog}\left(-\frac{-be+\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d}{be}\right)}{id} - \frac{B\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(-\frac{-be+\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d}{be}\right)}{id}$
derivativedivides	$-\frac{e(ad-cb)\left(\frac{dA\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{ie(ad-cb)}+\frac{dB\,\mathrm{dilog}\left(-\frac{-be+\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d}{be}\right)}{ie(ad-cb)}+\frac{dB\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(-\frac{-be+\left(\frac{be}{d}+\frac{(a}{d(}\right.}{be}\right.}{ie(ad-cb)}\right.}{d^2}$
default	$-\frac{e(ad-cb)\left(\frac{dA\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{ie(ad-cb)}+\frac{dB\,\mathrm{dilog}\left(-\frac{-be+\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d}{be}\right)}{ie(ad-cb)}+\frac{dB\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(-\frac{-be+\left(\frac{be}{d}+\frac{(a}{d(}\right.}{be}\right.}{ie(ad-cb)}\right.}{d^2}$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{\int \frac{A}{c+dx}\,dx + \int \frac{B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1371 vs. 2(70) = 140.
time = 41.92, size = 1371, normalized size = 18.04

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
*a^2*b*c*d^4*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - I*(b*x*e + a*e)^2
*B*a^3*d^5*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - I*A*b^5*c^3*e^3 + I
*B*b^5*c^3*e^3 + 3*I*A*a*b^4*c^2*d*e^3 - 3*I*B*a*b^4*c^2*d*e^3 - 3*I*A*a^2*
b^3*c*d^2*e^3 + 3*I*B*a^2*b^3*c*d^2*e^3 + I*A*a^3*b^2*d^3*e^3 - I*B*a^3*b^2
*d^3*e^3 - I*(b*x*e + a*e)*B*b^4*c^3*d*e^2/(d*x + c) + 3*I*(b*x*e + a*e)*B*
a*b^3*c^2*d^2*e^2/(d*x + c) - 3*I*(b*x*e + a*e)*B*a^2*b^2*c*d^3*e^2/(d*x +
c) + I*(b*x*e + a*e)*B*a^3*b*d^4*e^2/(d*x + c))*(b*c/((b*c*e - a*d*e)*(b*c
- a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))^2/(b^4*d*e^2 - 2*(b*x*e + a*e)
*b^3*d^2*e/(d*x + c) + (b*x*e + a*e)^2*b^2*d^3/(d*x + c)^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

3.35 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)}\,dx$

Optimal. Leaf size=44

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

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

Rubi [A]
time = 0.07, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.050, Rules used = {2562, 2338}

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

Antiderivative was successfully verified.

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

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

Rule 2338

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(35c+35dx)(ag+bgx)}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g(c+dx)}\right)dx$$

$$= \frac{b\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{35(bc-ad)g} - \frac{d\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{35(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{35(bc-ad)g} -$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{35(bc-ad)g} -$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{35(bc-ad)g} -$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{35(bc-ad)g} -$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} + \frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)}{35(bc-ad)g} - \left(A+\right.$$

$$= -\frac{B\log^2(a+bx)}{70(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} + \frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)}{35(bc-a}$$

$$= -\frac{B\log^2(a+bx)}{70(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} + \frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)}{35(bc-a}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.08, size = 207, normalized size = 4.70

$$\frac{2A\log(a+bx) - B\log^2(a+bx) + 2B\log(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right) - 2A\log(c+dx) + 2B\log\left(\frac{d(a+bx)}{-bc+ad}\right)\log(c+dx) - 2B\log\left(\frac{e(a+bx)}{c+dx}\right)\log(c+dx) - B\log^2(c+dx) + 2B\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right) + 2B\operatorname{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right) + 2B\operatorname{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)}{2(bc-ad)gi}$$

Antiderivative was successfully verified.

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

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

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

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 122 vs. $2(42) = 84$.
time = 0.58, size = 123, normalized size = 2.80

method	result	size
norman	$-\frac{B\ln\left(\frac{e(bx+a)}{dx+c}\right)^{2}}{2gi(ad-cb)}-\frac{A\ln\left(\frac{e(bx+a)}{dx+c}\right)}{gi(ad-cb)}$	72
risch	$\frac{A\ln(dx+c)}{gi(ad-cb)}-\frac{A\ln(bx+a)}{gi(ad-cb)}-\frac{B\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}{2gi(ad-cb)}$	100
derivativedivides	$-\frac{e(ad-cb)\left(\frac{d^{2}A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{ei(ad-cb)^{2}g}+\frac{d^{2}B\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}{2ei(ad-cb)^{2}g}\right)}{d^{2}}$	123
default	$-\frac{e(ad-cb)\left(\frac{d^{2}A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{ei(ad-cb)^{2}g}+\frac{d^{2}B\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}{2ei(ad-cb)^{2}g}\right)}{d^{2}}$	123

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 170 vs. $2(40) = 80$.
time = 0.28, size = 170, normalized size = 3.86

$$-B\left(\frac{\log\left(bx+a\right)}{\left(-i\,bc+i\,ad\right)g}-\frac{\log\left(dx+c\right)}{\left(-i\,bc+i\,ad\right)g}\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)-A\left(\frac{\log\left(bx+a\right)}{\left(-i\,bc+i\,ad\right)g}-\frac{\log\left(dx+c\right)}{\left(-i\,bc+i\,ad\right)g}\right)+\frac{\left(i\,\log\left(bx+a\right)^{2}-2i\,\log\left(bx+a\right)\log\left(dx+c\right)+i\,\log\left(dx+c\right)^{2}\right)B}{2\left(bcg-adg\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [**A**]
time = 0.36, size = 56, normalized size = 1.27

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 170 vs. $2(31) = 62$.
time = 0.36, size = 170, normalized size = 3.86

$$A\left(\frac{\log\left(x+\frac{-\frac{a^2d^2}{ad-bc}+\frac{2abcd}{ad-bc}+ad-\frac{b^2c^2}{ad-bc}+bc}{2bd}\right)}{gi\,(ad-bc)}-\frac{\log\left(x+\frac{\frac{a^2d^2}{ad-bc}-\frac{2abcd}{ad-bc}+ad+\frac{b^2c^2}{ad-bc}+bc}{2bd}\right)}{gi\,(ad-bc)}\right)-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2adgi-2bcgi}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 112 vs. $2(40) = 80$.
time = 3.30, size = 112, normalized size = 2.55

$$-\frac{\left(i\,Be\log\left(\frac{bxe+ae}{dx+c}\right)^2+2i\,Ae\log\left(\frac{bxe+ae}{dx+c}\right)\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{2\,g}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [B]
time = 5.74, size = 69, normalized size = 1.57

$$-\frac{B\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2-A\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,4\mathrm{i}}{2\,g\,i\,(a\,d-b\,c)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.36 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)}\,dx$

Optimal. Leaf size=173

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

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

Rubi [A]
time = 0.12, antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$,
Rules used = {2562, 45, 2372, 14, 2338}

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

Antiderivative was successfully verified.

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

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

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

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

Rule 2338

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

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(36c+36dx)(ag+bgx)^2}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)g^2(a+bx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)^2g^2(a+bx)} + \frac{d^2\left(A+B\log\right.}{36(bc-ad)^2g}\right.$$

$$= -\frac{(bd)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{36(bc-ad)^2g^2} + \frac{d^2\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{36(bc-ad)^2g^2} + \frac{b\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,d}{36(bc-ad)g^2}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)^2g^2} + \frac{d\left(A+\right.}{}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)^2g^2} + \frac{d\left(A+\right.}{}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)^2g^2} + \frac{d\left(A+\right.}{}$$

$$= -\frac{B}{36(bc-ad)g^2(a+bx)} - \frac{Bd\log(a+bx)}{36(bc-ad)^2g^2} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\,\mathrm{lo}}{}$$

$$= -\frac{B}{36(bc-ad)g^2(a+bx)} - \frac{Bd\log(a+bx)}{36(bc-ad)^2g^2} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\,\mathrm{lo}}{}$$

$$= -\frac{B}{36(bc-ad)g^2(a+bx)} - \frac{Bd\log(a+bx)}{36(bc-ad)^2g^2} + \frac{Bd\log^2(a+bx)}{72(bc-ad)^2g^2} - \frac{A+B\,\mathrm{lo}}{36(bc-a}$$

$$= -\frac{B}{36(bc-ad)g^2(a+bx)} - \frac{Bd\log(a+bx)}{36(bc-ad)^2g^2} + \frac{Bd\log^2(a+bx)}{72(bc-ad)^2g^2} - \frac{A+B\,\mathrm{lo}}{36(bc-a}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.21, size = 292, normalized size = 1.69

$$-\frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+2d(a+bx)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-2d(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)+2B(bc-ad+d(a+bx)\log(a+bx)-d(a+bx)\log(c+dx))-Bd(a+bx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+Bd(a+bx)\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{2(bc-ad)^2g^2i(a+bx)}$$

Antiderivative was successfully verified.

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

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

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

Maple [A]
time = 0.62, size = 288, normalized size = 1.66

method	result
norman	$\frac{-\frac{(Aad+Bbc)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{gi\left(a^2d^2-2abcd+b^2c^2\right)}-\frac{Bad\ln\left(\frac{e(bx+a)}{dx+c}\right)^2}{2gi\left(a^2d^2-2abcd+b^2c^2\right)}-\frac{b(Ad+Bd)x\ln\left(\frac{e(bx+a)}{dx+c}\right)}{gi\left(a^2d^2-2abcd+b^2c^2\right)}-\frac{(A+B)bx}{gia(ad-cb)}-\frac{bBdx\ln\left(\frac{e(bx+a)}{dx+c}\right)^2}{2gi\left(a^2d^2-2abcd+b^2c^2\right)}}{g(bx+a)}$
risch	$\frac{Ad\ln(dx+c)}{g^2i(ad-cb)^2}+\frac{A}{g^2i(ad-cb)(bx+a)}-\frac{Ad\ln(bx+a)}{g^2i(ad-cb)^2}-\frac{Bd\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2g^2i(ad-cb)^2}-\frac{Bbe\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{g^2i(ad-cb)^2\left(\frac{be}{d}+\frac{ea}{dx+c}-\frac{ecb}{d(dx+c)}\right.}\cdots$
derivativedivides	$-\frac{e(ad-cb)\left(\frac{d^2Ab}{i(ad-cb)^3g^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}+\frac{d^3A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{ei(ad-cb)^3g^2}-\frac{d^2Bb\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}}-\frac{1}{\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}}\right)}{i(ad-cb)^3g^2}+\frac{d^3B\ln\cdots}{2\cdots}\right.}{d^2}$
default	$-\frac{e(ad-cb)\left(\frac{d^2Ab}{i(ad-cb)^3g^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}+\frac{d^3A\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{ei(ad-cb)^3g^2}-\frac{d^2Bb\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}}-\frac{1}{\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}}\right)}{i(ad-cb)^3g^2}+\frac{d^3B\ln\cdots}{2\cdots}\right.}{d^2}$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 423 vs. 2(161) = 322.
time = 0.33, size = 423, normalized size = 2.45

$$B\left(\frac{1}{(-ib^2c+iabd)g^2x+(-iabc+ia^2d)g^2}-\frac{d\log(bx+a)}{(ib^2c^2-2iabcd+ia^2d^2)g^2}+\frac{d\log(dx+c)}{(ib^2c^2-2iabcd+ia^2d^2)g^2}\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)+A\left(\frac{1}{(-ib^2c+iabd)g^2x+(-iabc+ia^2d)g^2}-\frac{d\log(bx+a)}{(ib^2c^2-2iabcd+ia^2d^2)g^2}+\frac{d\log(dx+c)}{(ib^2c^2-2iabcd+ia^2d^2)g^2}\right)-\frac{\left((ibdx+iad)\log(bx+a)^2+(ibdx+iad)\log(dx+c)^2-2ibc+2iad-2(ibdx+iad)\log(bx+a)-2(-ibdx-iad+(ibdx+iad)\log(bx+a))\log(dx+c)\right)B}{2\left(ab^2c^2g^2-2a^2bcdg^2+a^3d^2g^2+(b^3c^2g^2-2ab^2cdg^2+a^2bd^2g^2)x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A]
time = 0.41, size = 157, normalized size = 0.91

$$-\frac{2\left(-i\,A-i\,B\right)bc+2\left(i\,A+i\,B\right)ad-\left(i\,Bbdx+i\,Bad\right)\log\left(\frac{(bx+a)e}{dx+c}\right)^{2}+2\left(\left(-i\,A-i\,B\right)bdx-i\,Bbc-i\,Aad\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{2\left(\left(b^{3}c^{2}-2\,ab^{2}cd+a^{2}bd^{2}\right)g^{2}x+\left(ab^{2}c^{2}-2\,a^{2}bcd+a^{3}d^{2}\right)g^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 386 vs. $2(144) = 288$.
time = 0.73, size = 386, normalized size = 2.23

$$-\frac{Bd\log\left(\frac{e(a+bx)}{c+dx}\right)^{2}}{2a^{2}d^{2}g^{2}i-4abcdg^{2}i+2b^{2}c^{2}g^{2}i}+\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a^{2}dg^{2}i-abcg^{2}i+abdg^{2}ix-b^{2}cg^{2}ix}+(A+B)\left(\frac{d\log\left(x+\frac{-\frac{a^{3}d^{4}}{(ad-bc)^{2}}+\frac{3a^{2}bcd^{3}}{(ad-bc)^{2}}-\frac{3ab^{2}c^{2}d^{2}}{(ad-bc)^{2}}+ad^{2}+\frac{b^{3}c^{3}d}{(ad-bc)^{2}}+bcd}{2bd^{2}}\right)}{g^{2}i\left(ad-bc\right)^{2}}-\frac{d\log\left(x+\frac{\frac{a^{3}d^{4}}{(ad-bc)^{2}}-\frac{3a^{2}bcd^{3}}{(ad-bc)^{2}}+\frac{3ab^{2}c^{2}d^{2}}{(ad-bc)^{2}}+ad^{2}-\frac{b^{3}c^{3}d}{(ad-bc)^{2}}+bcd}{2bd^{2}}\right)}{g^{2}i\left(ad-bc\right)^{2}}+\frac{1}{a^{2}dg^{2}i-abcg^{2}i+x\left(abdg^{2}i-b^{2}cg^{2}i\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [B]
time = 5.84, size = 241, normalized size = 1.39

$$\frac{A+B}{\left(a\,d-b\,c\right)\,\left(a\,g^2\,i+b\,g^2\,i\,x\right)}-\frac{B\,d\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)^2}{2\,g^2\,i\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(a\,d-b\,c\right)}{b\,d\,g^2\,i\,\left(\frac{x}{d}+\frac{a}{b\,d}\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{d\,\mathrm{atan}\left(\frac{\left(2\,b\,d\,x+\frac{a^2\,d^2\,g^2\,i-b^2\,c^2\,g^2\,i}{g^2\,i\,\left(a\,d-b\,c\right)}\right)\,1{}\mathrm{i}}{a\,d-b\,c}\right)\,\left(A+B\right)\,2{}\mathrm{i}}{g^2\,i\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.37 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)}\,dx$

Optimal. Leaf size=255

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

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

Rubi [A]
time = 0.16, antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$, Rules used = {2562, 45, 2372, 12, 14, 37, 2338}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
```

```
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 45

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

Rule 2338

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

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(37c+37dx)(ag+bgx)^3}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)g^3(a+bx)^3} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)^2g^3(a+bx)^2} + \frac{bd^2\left(A+B\log \ldots\right.}{37(bc-ad)^3 \ldots}\right.$$

$$= \frac{(bd^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{37(bc-ad)^3g^3} - \frac{d^3\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{37(bc-ad)^3g^3} - \frac{(bd)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} \ldots}{37(bc-ad)^2g^3}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A \ldots\right.}{37(bc- \ldots}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A \ldots\right.}{37(bc- \ldots}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A \ldots\right.}{37(bc- \ldots}$$

$$= -\frac{B}{148(bc-ad)g^3(a+bx)^2} + \frac{3Bd}{74(bc-ad)^2g^3(a+bx)} + \frac{3Bd^2\log(a+bx)}{74(bc-ad)^3g^3} \ldots$$

$$= -\frac{B}{148(bc-ad)g^3(a+bx)^2} + \frac{3Bd}{74(bc-ad)^2g^3(a+bx)} + \frac{3Bd^2\log(a+bx)}{74(bc-ad)^3g^3} \ldots$$

$$= -\frac{B}{148(bc-ad)g^3(a+bx)^2} + \frac{3Bd}{74(bc-ad)^2g^3(a+bx)} + \frac{3Bd^2\log(a+bx)}{74(bc-ad)^3g^3} \ldots$$

$$= -\frac{B}{148(bc-ad)g^3(a+bx)^2} + \frac{3Bd}{74(bc-ad)^2g^3(a+bx)} + \frac{3Bd^2\log(a+bx)}{74(bc-ad)^3g^3} \ldots$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.25, size = 418, normalized size = 1.64

$$\frac{-2(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+4d(bc-ad)(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+4d^2(a+bx)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-4d^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)+4Bd(a+bx)(bc-ad+d(a+bx)\log(a+bx)-d(a+bx)\log(c+dx))-B((bc-ad)^2+2d(-bc+ad)(a+bx)-2d^2(a+bx)^2\log(a+bx)+2d^2(a+bx)^2\log(c+dx))-2Bd^2(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+2Bd^2(a+bx)^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^3g^3i(a+bx)^2}$$

Antiderivative was successfully verified.

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

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

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

Maple [A]
time = 0.65, size = 460, normalized size = 1.80 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 883 vs. 2(238) = 476.
time = 0.40, size = 883, normalized size = 3.46

$$-\frac{1}{2}B\left(\frac{2bdx-bc+3ad}{(-ib^4c^2+2iab^3cd-ia^2b^2d^2)g^3x^2+2(-iab^3c^2+2ia^2b^2cd-ia^3bd^2)g^3x+(-ia^2b^2c^2+2ia^3bcd-ia^4d^2)g^3}+\frac{2d^2\log(bx+a)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g^3}-\frac{2d^2\log(dx+c)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g^3}\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)-\frac{1}{2}A\left(\frac{2bdx-bc+3ad}{(-ib^4c^2+2iab^3cd-ia^2b^2d^2)g^3x^2+2(-iab^3c^2+2ia^2b^2cd-ia^3bd^2)g^3x+(-ia^2b^2c^2+2ia^3bcd-ia^4d^2)g^3}+\frac{2d^2\log(bx+a)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g^3}-\frac{2d^2\log(dx+c)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g^3}\right)+\frac{\left(ib^2c^2-8iabcd+7ia^2d^2-2(-ib^2d^2x^2-2iabd^2x-ia^2d^2)\log(bx+a)^2-2(-ib^2d^2x^2-2iabd^2x-ia^2d^2)\log(dx+c)^2-6(ib^2cd-iabd^2)x-6(ib^2d^2x^2+2iabd^2x+ia^2d^2)\log(bx+a)-2(-3ib^2d^2x^2-6iabd^2x-3ia^2d^2+2(ib^2d^2x^2+2iabd^2x+ia^2d^2)\log(bx+a))\log(dx+c)\right)B}{4(a^2b^3c^3g^3-3a^3b^2c^2dg^3+3a^4bcd^2g^3-a^5d^3g^3+(b^5c^3g^3-3ab^4c^2dg^3+3a^2b^3cd^2g^3-a^3b^2d^3g^3)x^2+2(ab^4c^3g^3-3a^2b^3c^2dg^3+3a^3b^2cd^2g^3-a^4bd^3g^3)x)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*B*((2*b*d*x - b*c + 3*a*d)/((-I*b^4*c^2 + 2*I*a*b^3*c*d - I*a^2*b^2*d^
2)*g^3*x^2 + 2*(-I*a*b^3*c^2 + 2*I*a^2*b^2*c*d - I*a^3*b*d^2)*g^3*x + (-I*a
^2*b^2*c^2 + 2*I*a^3*b*c*d - I*a^4*d^2)*g^3) + 2*d^2*log(b*x + a)/((-I*b^3*
c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3) - 2*d^2*log(d*x +
 c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3))*log
(b*x*e/(d*x + c) + a*e/(d*x + c)) - 1/2*A*((2*b*d*x - b*c + 3*a*d)/((-I*b^4
*c^2 + 2*I*a*b^3*c*d - I*a^2*b^2*d^2)*g^3*x^2 + 2*(-I*a*b^3*c^2 + 2*I*a^2*b
^2*c*d - I*a^3*b*d^2)*g^3*x + (-I*a^2*b^2*c^2 + 2*I*a^3*b*c*d - I*a^4*d^2)*
g^3) + 2*d^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2
+ I*a^3*d^3)*g^3) - 2*d^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I
*a^2*b*c*d^2 + I*a^3*d^3)*g^3)) + 1/4*(I*b^2*c^2 - 8*I*a*b*c*d + 7*I*a^2*d^
2 - 2*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^2)*log(b*x + a)^2 - 2*(-I*b
```

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

Fricas [**A**]
time = 0.37, size = 356, normalized size = 1.40

$$-\frac{(-2i\,A-i\,B)b^2c^2-8\,(-i\,A-i\,B)abcd+(-6i\,A-7i\,B)a^2d^2-2\,(-i\,Bb^2d^2x^2-2i\,Babd^2x-i\,Ba^2d^2)\log\left(\frac{(bx+a)e}{dx+c}\right)^2-2\,((-2i\,A-3i\,B)b^2cd+(2i\,A+3i\,B)abd^2)x-2\,((-2i\,A-3i\,B)b^2d^2x^2+i\,Bb^2c^2-4i\,Babcd-2i\,Aa^2d^2+2\,(-i\,Bb^2cd+2\,(-i\,A-i\,B)abd^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4\,((b^5c^3-3\,ab^4c^2d+3\,a^2b^3cd^2-a^3b^2d^3)g^3x^2+2\,(ab^4c^3-3\,a^2b^3c^2d+3\,a^3b^2cd^2-a^4bd^3)g^3x+(a^2b^3c^3-3\,a^3b^2c^2d+3\,a^4bcd^2-a^5d^3)g^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*((-2*I*A - I*B)*b^2*c^2 - 8*(-I*A - I*B)*a*b*c*d + (-6*I*A - 7*I*B)*a^
2*d^2 - 2*(-I*B*b^2*d^2*x^2 - 2*I*B*a*b*d^2*x - I*B*a^2*d^2)*log((b*x + a)*
e/(d*x + c))^2 - 2*((-2*I*A - 3*I*B)*b^2*c*d + (2*I*A + 3*I*B)*a*b*d^2)*x -
 2*((-2*I*A - 3*I*B)*b^2*d^2*x^2 + I*B*b^2*c^2 - 4*I*B*a*b*c*d - 2*I*A*a^2*
d^2 + 2*(-I*B*b^2*c*d + 2*(-I*A - I*B)*a*b*d^2)*x)*log((b*x + a)*e/(d*x + c
)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^3*x^2 + 2*
(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^2 - a^4*b*d^3)*g^3*x + (a^2*b^
3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 - a^5*d^3)*g^3)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 889 vs. $2(221) = 442$.
time = 3.26, size = 889, normalized size = 3.49

$$-\frac{Bd^2\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2a^3d^3g^3i-6a^2bcd^2g^3i+6ab^2c^2dg^3i-2b^3c^3g^3i}+\frac{d^2\cdot(2A+3B)\log\left(x+\frac{2Aad^3+2Abcd^2+3Bad^3+3Bbcd^2-\frac{a^4d^6\cdot(2A+3B)}{(ad-bc)^3}+\frac{4a^3bcd^5\cdot(2A+3B)}{(ad-bc)^3}-\frac{6a^2b^2c^2d^4\cdot(2A+3B)}{(ad-bc)^3}+\frac{4ab^3c^3d^3\cdot(2A+3B)}{(ad-bc)^3}-\frac{b^4c^4d^2\cdot(2A+3B)}{(ad-bc)^3}}{4Abd^3+6Bbd^3}\right)}{2g^3i\,(ad-bc)^3}-\frac{d^2\cdot(2A+3B)\log\left(x+\frac{2Aad^3+2Abcd^2+3Bad^3+3Bbcd^2+\frac{a^4d^6\cdot(2A+3B)}{(ad-bc)^3}-\frac{4a^3bcd^5\cdot(2A+3B)}{(ad-bc)^3}+\frac{6a^2b^2c^2d^4\cdot(2A+3B)}{(ad-bc)^3}-\frac{4ab^3c^3d^3\cdot(2A+3B)}{(ad-bc)^3}+\frac{b^4c^4d^2\cdot(2A+3B)}{(ad-bc)^3}}{4Abd^3+6Bbd^3}\right)}{2g^3i\,(ad-bc)^3}+\frac{(3Bad-Bbc+2Bbdx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2a^4d^2g^3i-4a^3bcdg^3i+4a^3bd^2g^3ix+2a^2b^2c^2g^3i-8a^2b^2cdg^3ix+2a^2b^2d^2g^3ix^2+4ab^3c^2g^3ix-4ab^3cdg^3ix^2+2b^4c^2g^3ix^2}+\frac{6Aad-2Abc+7Bad-Bbc+x(4Abd+6Bbd)}{4a^4d^2g^3i-8a^3bcdg^3i+4a^2b^2c^2g^3i+x^2\cdot(4a^2b^2d^2g^3i-8ab^3cdg^3i+4b^4c^2g^3i)+x(8a^3bd^2g^3i-16a^2b^2cdg^3i+8ab^3c^2g^3i)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
*3))/(2*g**3*i*(a*d - b*c)**3) + (3*B*a*d - B*b*c + 2*B*b*d*x)*log(e*(a + b
*x)/(c + d*x))/(2*a**4*d**2*g**3*i - 4*a**3*b*c*d*g**3*i + 4*a**3*b*d**2*g*
*3*i*x + 2*a**2*b**2*c**2*g**3*i - 8*a**2*b**2*c*d*g**3*i*x + 2*a**2*b**2*d
**2*g**3*i*x**2 + 4*a*b**3*c**2*g**3*i*x - 4*a*b**3*c*d*g**3*i*x**2 + 2*b**
4*c**2*g**3*i*x**2) + (6*A*a*d - 2*A*b*c + 7*B*a*d - B*b*c + x*(4*A*b*d + 6
*B*b*d))/(4*a**4*d**2*g**3*i - 8*a**3*b*c*d*g**3*i + 4*a**2*b**2*c**2*g**3*
i + x**2*(4*a**2*b**2*d**2*g**3*i - 8*a*b**3*c*d*g**3*i + 4*b**4*c**2*g**3*
i) + x*(8*a**3*b*d**2*g**3*i - 16*a**2*b**2*c*d*g**3*i + 8*a*b**3*c**2*g**3
*i))
```

Giac [A]
time = 48.93, size = 117, normalized size = 0.46

$$\frac{\left(2i\,Be^{3}\log\left(\frac{bxe+ae}{dx+c}\right)+2i\,Ae^{3}+i\,Be^{3}\right)(dx+c)^{2}\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)^{2}}{4\,(bxe+ae)^{2}g^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [B]
time = 6.93, size = 545, normalized size = 2.14

$$\frac{3\,A\,a\,d}{2\,g^3\,i\,(a\,d-b\,c)^2\,(a+b\,x)^2}-\frac{B\,d^2\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2}{2\,g^3\,i\,(a\,d-b\,c)^3}-\frac{A\,b\,c}{2\,g^3\,i\,(a\,d-b\,c)^2\,(a+b\,x)^2}+\frac{7\,B\,a\,d}{4\,g^3\,i\,(a\,d-b\,c)^2\,(a+b\,x)^2}-\frac{B\,b\,c}{4\,g^3\,i\,(a\,d-b\,c)^2\,(a+b\,x)^2}+\frac{3\,B\,a^2\,d^2\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{2\,g^3\,i\,(a\,d-b\,c)^3\,(a+b\,x)^2}+\frac{B\,b^2\,c^2\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{2\,g^3\,i\,(a\,d-b\,c)^3\,(a+b\,x)^2}+\frac{A\,b\,d\,x}{g^3\,i\,(a\,d-b\,c)^2\,(a+b\,x)^2}+\frac{3\,B\,b\,d\,x}{2\,g^3\,i\,(a\,d-b\,c)^2\,(a+b\,x)^2}+\frac{B\,a\,b\,d^2\,x\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^3\,i\,(a\,d-b\,c)^3\,(a+b\,x)^2}-\frac{B\,b^2\,c\,d\,x\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^3\,i\,(a\,d-b\,c)^3\,(a+b\,x)^2}-\frac{2\,B\,a\,b\,c\,d\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^3\,i\,(a\,d-b\,c)^3\,(a+b\,x)^2}+\frac{A\,d^2\,\mathrm{atan}\left(\frac{a\,d\,1{}\mathrm{i}+b\,c\,1{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}\right)\,2{}\mathrm{i}}{g^3\,i\,(a\,d-b\,c)^3}+\frac{B\,d^2\,\mathrm{atan}\left(\frac{a\,d\,1{}\mathrm{i}+b\,c\,1{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}\right)\,3{}\mathrm{i}}{g^3\,i\,(a\,d-b\,c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (A*d^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(g^3*i*(a*d - b*c
)^3) + (B*d^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*3i)/(g^3*i*(a*
d - b*c)^3) - (B*d^2*log((e*(a + b*x))/(c + d*x))^2)/(2*g^3*i*(a*d - b*c)^3
) + (3*A*a*d)/(2*g^3*i*(a*d - b*c)^2*(a + b*x)^2) - (A*b*c)/(2*g^3*i*(a*d -
 b*c)^2*(a + b*x)^2) + (7*B*a*d)/(4*g^3*i*(a*d - b*c)^2*(a + b*x)^2) - (B*b
*c)/(4*g^3*i*(a*d - b*c)^2*(a + b*x)^2) + (3*B*a^2*d^2*log((e*(a + b*x))/(c
 + d*x)))/(2*g^3*i*(a*d - b*c)^3*(a + b*x)^2) + (B*b^2*c^2*log((e*(a + b*x)
)/(c + d*x)))/(2*g^3*i*(a*d - b*c)^3*(a + b*x)^2) + (A*b*d*x)/(g^3*i*(a*d -
 b*c)^2*(a + b*x)^2) + (3*B*b*d*x)/(2*g^3*i*(a*d - b*c)^2*(a + b*x)^2) + (B
*a*b*d^2*x*log((e*(a + b*x))/(c + d*x)))/(g^3*i*(a*d - b*c)^3*(a + b*x)^2)
- (B*b^2*c*d*x*log((e*(a + b*x))/(c + d*x)))/(g^3*i*(a*d - b*c)^3*(a + b*x)
^2) - (2*B*a*b*c*d*log((e*(a + b*x))/(c + d*x)))/(g^3*i*(a*d - b*c)^3*(a +
b*x)^2)
```

3.38 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)}\,dx$

Optimal. Leaf size=373

$$-\frac{3bBd^2(c+dx)}{(bc-ad)^4g^4i(a+bx)}+\frac{3b^2Bd(c+dx)^2}{4(bc-ad)^4g^4i(a+bx)^2}-\frac{b^3B(c+dx)^3}{9(bc-ad)^4g^4i(a+bx)^3}+\frac{Bd^3\log^2\left(\frac{a+bx}{c+dx}\right)}{2(bc-ad)^4g^4i}-\frac{3bd^2(c+dx)}{(bc-}$$

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

Rubi [A]
time = 0.20, antiderivative size = 373, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2562, 45, 2372, 12, 14, 2338}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

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

Rule 2338

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

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(38c+38dx)(ag+bgx)^4}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{38(bc-ad)g^4(a+bx)^4} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{38(bc-ad)^2g^4(a+bx)^3} + \frac{bd^2\left(A+B\log\right.}{38(bc-ad)^3g}\right.$$

$$= -\frac{(bd^3)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{38(bc-ad)^4g^4} + \frac{d^4\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{38(bc-ad)^4g^4} + \frac{(bd^2)\int \frac{A+B\log\left(\frac{e(a+}{c+}\right.}{(a+bx)^2}}{38(bc-ad)^3g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{114(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{76(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(}{c}\right.\right.}{38(bc-ad)^3g^4(a}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{114(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{76(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(}{c}\right.\right.}{38(bc-ad)^3g^4(a}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{114(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{76(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(}{c}\right.\right.}{38(bc-ad)^3g^4(a}$$

$$= -\frac{B}{342(bc-ad)g^4(a+bx)^3} + \frac{5Bd}{456(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2}{228(bc-ad)^3g^4(}$$

$$= -\frac{B}{342(bc-ad)g^4(a+bx)^3} + \frac{5Bd}{456(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2}{228(bc-ad)^3g^4(}$$

$$= -\frac{B}{342(bc-ad)g^4(a+bx)^3} + \frac{5Bd}{456(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2}{228(bc-ad)^3g^4(}$$

$$= -\frac{B}{342(bc-ad)g^4(a+bx)^3} + \frac{5Bd}{456(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2}{228(bc-ad)^3g^4(}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.45, size = 492, normalized size = 1.32

$$\frac{-\frac{12A(bc-ad)^3}{(a+bx)^3} - \frac{4B(bc-ad)^3}{(a+bx)^3} + \frac{18Ad(bc-ad)^2}{(a+bx)^2} + \frac{15Bd(bc-ad)^2}{(a+bx)^2} + \frac{36Ad^2(-bc+ad)}{a+bx} + \frac{66Bd^2(-bc+ad)}{a+bx} - 36Ad^3\log(a+bx) - 66Bd^3\log(a+bx) + 18Bd^3\log^2(a+bx) - \frac{12B(bc-ad)^3\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3} + \frac{18Bd(bc-ad)^2\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} + \frac{36Bd^2(-bc+ad)\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} - 36Bd^3\log(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right) + 36Ad^3\log(c+dx) + 66Bd^3\log(c+dx) - 36Bd^3\log\left(\frac{d(a+bx)}{-bc+ad}\right)\log(c+dx) + 36Bd^3\log\left(\frac{e(a+bx)}{c+dx}\right)\log(c+dx) + 18Bd^3\log^2(c+dx) - 36Bd^3\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right) - 36Bd^3\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right) - 36Bd^3\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)}{36(bc-ad)^4g^4i}$$

Antiderivative was successfully verified.

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

```
[Out] ((-12*A*(b*c - a*d)^3)/(a + b*x)^3 - (4*B*(b*c - a*d)^3)/(a + b*x)^3 + (18*
A*d*(b*c - a*d)^2)/(a + b*x)^2 + (15*B*d*(b*c - a*d)^2)/(a + b*x)^2 + (36*A
*d^2*(-(b*c) + a*d))/(a + b*x) + (66*B*d^2*(-(b*c) + a*d))/(a + b*x) - 36*A
*d^3*Log[a + b*x] - 66*B*d^3*Log[a + b*x] + 18*B*d^3*Log[a + b*x]^2 - (12*B
```

```
*(b*c - a*d)^3*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^3 + (18*B*d*(b*c - a
*d)^2*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^2 + (36*B*d^2*(-(b*c) + a*d)*
Log[(e*(a + b*x))/(c + d*x)])/(a + b*x) - 36*B*d^3*Log[a + b*x]*Log[(e*(a +
 b*x))/(c + d*x)] + 36*A*d^3*Log[c + d*x] + 66*B*d^3*Log[c + d*x] - 36*B*d^
3*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 36*B*d^3*Log[(e*(a + b*x
))/(c + d*x)]*Log[c + d*x] + 18*B*d^3*Log[c + d*x]^2 - 36*B*d^3*Log[a + b*x
]*Log[(b*(c + d*x))/(b*c - a*d)] - 36*B*d^3*PolyLog[2, (d*(a + b*x))/(-(b*c
) + a*d)] - 36*B*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(36*(b*c - a*d)
^4*g^4*i)
```

Maple [**A**]
time = 0.84, size = 637, normalized size = 1.71 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1456 vs. 2(343) = 686.
time = 0.54, size = 1456, normalized size = 3.90

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
5*a*b*d^2)*x)/((I*b^6*c^3 - 3*I*a*b^5*c^2*d + 3*I*a^2*b^4*c*d^2 - I*a^3*b^3
*d^3)*g^4*x^3 + 3*(I*a*b^5*c^3 - 3*I*a^2*b^4*c^2*d + 3*I*a^3*b^3*c*d^2 - I*
a^4*b^2*d^3)*g^4*x^2 + 3*(I*a^2*b^4*c^3 - 3*I*a^3*b^3*c^2*d + 3*I*a^4*b^2*c
*d^2 - I*a^5*b*d^3)*g^4*x + (I*a^3*b^3*c^3 - 3*I*a^4*b^2*c^2*d + 3*I*a^5*b*
c*d^2 - I*a^6*d^3)*g^4) + 6*d^3*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d
+ 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4) - 6*d^3*log(d*x +
 c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 +
```

```
I*a^4*d^4)*g^4))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 1/6*A*((6*b^2*d^2*
x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((I*b
^6*c^3 - 3*I*a*b^5*c^2*d + 3*I*a^2*b^4*c*d^2 - I*a^3*b^3*d^3)*g^4*x^3 + 3*(
I*a*b^5*c^3 - 3*I*a^2*b^4*c^2*d + 3*I*a^3*b^3*c*d^2 - I*a^4*b^2*d^3)*g^4*x^
2 + 3*(I*a^2*b^4*c^3 - 3*I*a^3*b^3*c^2*d + 3*I*a^4*b^2*c*d^2 - I*a^5*b*d^3)
*g^4*x + (I*a^3*b^3*c^3 - 3*I*a^4*b^2*c^2*d + 3*I*a^5*b*c*d^2 - I*a^6*d^3)*
g^4) + 6*d^3*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d
^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4) - 6*d^3*log(d*x + c)/((I*b^4*c^4 - 4
*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4)) -
 1/36*(-4*I*b^3*c^3 + 27*I*a*b^2*c^2*d - 108*I*a^2*b*c*d^2 + 85*I*a^3*d^3 -
 66*(I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 - 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^
2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*log(b*x + a)^2 - 18*(-I*b^3*d^3*x^3 - 3*I*
a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*log(d*x + c)^2 - 3*(-5*I*b^3*c
^2*d + 54*I*a*b^2*c*d^2 - 49*I*a^2*b*d^3)*x - 66*(I*b^3*d^3*x^3 + 3*I*a*b^2
*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a) - 6*(-11*I*b^3*d^3*x^3
 - 33*I*a*b^2*d^3*x^2 - 33*I*a^2*b*d^3*x - 11*I*a^3*d^3 + 6*(I*b^3*d^3*x^3
+ 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a))*log(d*x +
c))*B/(a^3*b^4*c^4*g^4 - 4*a^4*b^3*c^3*d*g^4 + 6*a^5*b^2*c^2*d^2*g^4 - 4*a^
6*b*c*d^3*g^4 + a^7*d^4*g^4 + (b^7*c^4*g^4 - 4*a*b^6*c^3*d*g^4 + 6*a^2*b^5*
c^2*d^2*g^4 - 4*a^3*b^4*c*d^3*g^4 + a^4*b^3*d^4*g^4)*x^3 + 3*(a*b^6*c^4*g^4
 - 4*a^2*b^5*c^3*d*g^4 + 6*a^3*b^4*c^2*d^2*g^4 - 4*a^4*b^3*c*d^3*g^4 + a^5*
b^2*d^4*g^4)*x^2 + 3*(a^2*b^5*c^4*g^4 - 4*a^3*b^4*c^3*d*g^4 + 6*a^4*b^3*c^2
*d^2*g^4 - 4*a^5*b^2*c*d^3*g^4 + a^6*b*d^4*g^4)*x)
```

Fricas [A]
time = 0.38, size = 619, normalized size = 1.66

$$-\frac{4\,(-3i\,A - i\,B)b^3c^3 + 27\,(2i\,A + i\,B)ab^2c^2d + 108\,(-i\,A - i\,B)a^2bcd^2 - (-66i\,A - 85i\,B)a^3d^3 + 6\,((-6i\,A - 11i\,B)b^3cd^2 + (6i\,A + 11i\,B)ab^2d^3)x^2 + 18\,(-i\,Bb^3d^3x^3 - 3i\,Bab^2d^3x^2 - 3i\,Ba^2bd^3x - i\,Ba^3d^3)\log\left(\frac{(bx+a)e}{dx+c}\right)^2 + 3\,((6i\,A + 5i\,B)b^3c^2d + 18\,(-2i\,A - 3i\,B)ab^2cd^2 + (30i\,A + 49i\,B)a^2bd^3)x + 6\,((-6i\,A - 11i\,B)b^3d^3x^3 - 2i\,Bb^3c^3 + 9i\,Bab^2c^2d - 18i\,Ba^2bcd^2 - 6i\,Aa^3d^3 + 3\,(-2i\,Bb^3cd^2 + 3\,(-2i\,A - 3i\,B)ab^2d^3)x^2 + 3\,(i\,Bb^3c^2d - 6i\,Bab^2cd^2 + 6\,(-i\,A - i\,B)a^2bd^3)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{36\,((b^7c^4 - 4\,ab^6c^3d + 6\,a^2b^5c^2d^2 - 4\,a^3b^4cd^3 + a^4b^3d^4)g^4x^3 + 3\,(ab^6c^4 - 4\,a^2b^5c^3d + 6\,a^3b^4c^2d^2 - 4\,a^4b^3cd^3 + a^5b^2d^4)g^4x^2 + 3\,(a^2b^5c^4 - 4\,a^3b^4c^3d + 6\,a^4b^3c^2d^2 - 4\,a^5b^2cd^3 + a^6bd^4)g^4x + (a^3b^4c^4 - 4\,a^4b^3c^3d + 6\,a^5b^2c^2d^2 - 4\,a^6bcd^3 + a^7d^4)g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(4*(-3*I*A - I*B)*b^3*c^3 + 27*(2*I*A + I*B)*a*b^2*c^2*d + 108*(-I*A
- I*B)*a^2*b*c*d^2 - (-66*I*A - 85*I*B)*a^3*d^3 + 6*((-6*I*A - 11*I*B)*b^3*
c*d^2 + (6*I*A + 11*I*B)*a*b^2*d^3)*x^2 + 18*(-I*B*b^3*d^3*x^3 - 3*I*B*a*b^
2*d^3*x^2 - 3*I*B*a^2*b*d^3*x - I*B*a^3*d^3)*log((b*x + a)*e/(d*x + c))^2 +
 3*((6*I*A + 5*I*B)*b^3*c^2*d + 18*(-2*I*A - 3*I*B)*a*b^2*c*d^2 + (30*I*A +
 49*I*B)*a^2*b*d^3)*x + 6*((-6*I*A - 11*I*B)*b^3*d^3*x^3 - 2*I*B*b^3*c^3 +
9*I*B*a*b^2*c^2*d - 18*I*B*a^2*b*c*d^2 - 6*I*A*a^3*d^3 + 3*(-2*I*B*b^3*c*d^
2 + 3*(-2*I*A - 3*I*B)*a*b^2*d^3)*x^2 + 3*(I*B*b^3*c^2*d - 6*I*B*a*b^2*c*d^
2 + 6*(-I*A - I*B)*a^2*b*d^3)*x)*log((b*x + a)*e/(d*x + c)))/((b^7*c^4 - 4*
a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^4*x^3 +
3*(a*b^6*c^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5*
b^2*d^4)*g^4*x^2 + 3*(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2 - 4
```

```
*a^5*b^2*c*d^3 + a^6*b*d^4)*g^4*x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6*a^5*
b^2*c^2*d^2 - 4*a^6*b*c*d^3 + a^7*d^4)*g^4)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1392 vs. $2(332) = 664$.
time = 12.04, size = 1392, normalized size = 3.73

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -B*d**3*log(e*(a + b*x)/(c + d*x))**2/(2*a**4*d**4*g**4*i - 8*a**3*b*c*d**3
*g**4*i + 12*a**2*b**2*c**2*d**2*g**4*i - 8*a*b**3*c**3*d*g**4*i + 2*b**4*c
**4*g**4*i) + d**3*(6*A + 11*B)*log(x + (6*A*a*d**4 + 6*A*b*c*d**3 + 11*B*a
*d**4 + 11*B*b*c*d**3 - a**5*d**8*(6*A + 11*B)/(a*d - b*c)**4 + 5*a**4*b*c*
d**7*(6*A + 11*B)/(a*d - b*c)**4 - 10*a**3*b**2*c**2*d**6*(6*A + 11*B)/(a*d
 - b*c)**4 + 10*a**2*b**3*c**3*d**5*(6*A + 11*B)/(a*d - b*c)**4 - 5*a*b**4*
c**4*d**4*(6*A + 11*B)/(a*d - b*c)**4 + b**5*c**5*d**3*(6*A + 11*B)/(a*d -
b*c)**4)/(12*A*b*d**4 + 22*B*b*d**4))/(6*g**4*i*(a*d - b*c)**4) - d**3*(6*A
 + 11*B)*log(x + (6*A*a*d**4 + 6*A*b*c*d**3 + 11*B*a*d**4 + 11*B*b*c*d**3 +
 a**5*d**8*(6*A + 11*B)/(a*d - b*c)**4 - 5*a**4*b*c*d**7*(6*A + 11*B)/(a*d
- b*c)**4 + 10*a**3*b**2*c**2*d**6*(6*A + 11*B)/(a*d - b*c)**4 - 10*a**2*b*
*3*c**3*d**5*(6*A + 11*B)/(a*d - b*c)**4 + 5*a*b**4*c**4*d**4*(6*A + 11*B)/
(a*d - b*c)**4 - b**5*c**5*d**3*(6*A + 11*B)/(a*d - b*c)**4)/(12*A*b*d**4 +
 22*B*b*d**4))/(6*g**4*i*(a*d - b*c)**4) + (11*B*a**2*d**2 - 7*B*a*b*c*d +
15*B*a*b*d**2*x + 2*B*b**2*c**2 - 3*B*b**2*c*d*x + 6*B*b**2*d**2*x**2)*log(
e*(a + b*x)/(c + d*x))/(6*a**6*d**3*g**4*i - 18*a**5*b*c*d**2*g**4*i + 18*a
**5*b*d**3*g**4*i*x + 18*a**4*b**2*c**2*d*g**4*i - 54*a**4*b**2*c*d**2*g**4
*i*x + 18*a**4*b**2*d**3*g**4*i*x**2 - 6*a**3*b**3*c**3*g**4*i + 54*a**3*b*
*3*c**2*d*g**4*i*x - 54*a**3*b**3*c*d**2*g**4*i*x**2 + 6*a**3*b**3*d**3*g**
4*i*x**3 - 18*a**2*b**4*c**3*g**4*i*x + 54*a**2*b**4*c**2*d*g**4*i*x**2 - 1
8*a**2*b**4*c*d**2*g**4*i*x**3 - 18*a*b**5*c**3*g**4*i*x**2 + 18*a*b**5*c**
2*d*g**4*i*x**3 - 6*b**6*c**3*g**4*i*x**3) + (66*A*a**2*d**2 - 42*A*a*b*c*d
 + 12*A*b**2*c**2 + 85*B*a**2*d**2 - 23*B*a*b*c*d + 4*B*b**2*c**2 + x**2*(3
6*A*b**2*d**2 + 66*B*b**2*d**2) + x*(90*A*a*b*d**2 - 18*A*b**2*c*d + 147*B*
a*b*d**2 - 15*B*b**2*c*d))/(36*a**6*d**3*g**4*i - 108*a**5*b*c*d**2*g**4*i
+ 108*a**4*b**2*c**2*d*g**4*i - 36*a**3*b**3*c**3*g**4*i + x**3*(36*a**3*b*
*3*d**3*g**4*i - 108*a**2*b**4*c*d**2*g**4*i + 108*a*b**5*c**2*d*g**4*i - 3
6*b**6*c**3*g**4*i) + x**2*(108*a**4*b**2*d**3*g**4*i - 324*a**3*b**3*c*d**
2*g**4*i + 324*a**2*b**4*c**2*d*g**4*i - 108*a*b**5*c**3*g**4*i) + x*(108*a
**5*b*d**3*g**4*i - 324*a**4*b**2*c*d**2*g**4*i + 324*a**3*b**3*c**2*d*g**4
*i - 108*a**2*b**4*c**3*g**4*i))
```

Giac [**A**]

time = 62.32, size = 240, normalized size = 0.64

$$-\frac{\left(-12i\,Bbe^4\log\left(\frac{bxe+ae}{dx+c}\right)+\frac{18i\,(bxe+ae)Bde^3\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-12i\,Abe^4-4i\,Bbe^4+\frac{18i\,(bxe+ae)Ade^3}{dx+c}+\frac{9i\,(bxe+ae)Bde^3}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)^2}{36\left(\frac{(bxe+ae)^3bcg^4}{(dx+c)^3}-\frac{(bxe+ae)^3adg^4}{(dx+c)^3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(-12*I*B*b*e^4*log((b*x*e + a*e)/(d*x + c)) + 18*I*(b*x*e + a*e)*B*d*
e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 12*I*A*b*e^4 - 4*I*B*b*e^4 + 1
8*I*(b*x*e + a*e)*A*d*e^3/(d*x + c) + 9*I*(b*x*e + a*e)*B*d*e^3/(d*x + c))*
(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))^2/(
(b*x*e + a*e)^3*b*c*g^4/(d*x + c)^3 - (b*x*e + a*e)^3*a*d*g^4/(d*x + c)^3)
```

Mupad [B]
time = 9.51, size = 970, normalized size = 2.60

$$\frac{11\,A\,a^2\,d^2}{6\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}-\frac{B\,d^3\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2}{2\,g^4\,i\,(a\,d-b\,c)^4}+\frac{A\,b^2\,c^2}{3\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}+\frac{85\,B\,a^2\,d^2}{36\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}+\frac{B\,b^2\,c^2}{9\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}+\frac{11\,B\,a^3\,d^3\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{6\,g^4\,i\,(a\,d-b\,c)^4\,(a+b\,x)^3}-\frac{B\,b^3\,c^3\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{3\,g^4\,i\,(a\,d-b\,c)^4\,(a+b\,x)^3}+\frac{A\,b^2\,d^2\,x^2}{g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}+\frac{11\,B\,b^2\,d^2\,x^2}{6\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}-\frac{7\,A\,a\,b\,c\,d}{6\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}-\frac{23\,B\,a\,b\,c\,d}{36\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}+\frac{5\,A\,a\,b\,d^2\,x}{2\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}+\frac{49\,B\,a\,b\,d^2\,x}{12\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}-\frac{A\,b^2\,c\,d\,x}{2\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}-\frac{5\,B\,b^2\,c\,d\,x}{12\,g^4\,i\,(a\,d-b\,c)^3\,(a+b\,x)^3}+\frac{3\,B\,a\,b^2\,c^2\,d\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{2\,g^4\,i\,(a\,d-b\,c)^4\,(a+b\,x)^3}-\frac{3\,B\,a^2\,b\,c\,d^2\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^4\,i\,(a\,d-b\,c)^4\,(a+b\,x)^3}+\frac{5\,B\,a^2\,b\,d^3\,x\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{2\,g^4\,i\,(a\,d-b\,c)^4\,(a+b\,x)^3}+\frac{B\,b^3\,c^2\,d\,x\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{2\,g^4\,i\,(a\,d-b\,c)^4\,(a+b\,x)^3}+\frac{B\,a\,b^2\,d^3\,x^2\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^4\,i\,(a\,d-b\,c)^4\,(a+b\,x)^3}-\frac{B\,b^3\,c\,d^2\,x^2\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^4\,i\,(a\,d-b\,c)^4\,(a+b\,x)^3}-\frac{3\,B\,a\,b^2\,c\,d^2\,x\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^4\,i\,(a\,d-b\,c)^4\,(a+b\,x)^3}+\frac{A\,d^3\,\mathrm{atan}\left(\frac{a\,d\,1i+b\,c\,1i+b\,d\,x\,2i}{a\,d-b\,c}\right)\,2i}{g^4\,i\,(a\,d-b\,c)^4}+\frac{B\,d^3\,\mathrm{atan}\left(\frac{a\,d\,1i+b\,c\,1i+b\,d\,x\,2i}{a\,d-b\,c}\right)\,11i}{3\,g^4\,i\,(a\,d-b\,c)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (A*d^3*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(g^4*i*(a*d - b*c
)^4) + (B*d^3*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*11i)/(3*g^4*i*
(a*d - b*c)^4) - (B*d^3*log((e*(a + b*x))/(c + d*x))^2)/(2*g^4*i*(a*d - b*c
)^4) + (11*A*a^2*d^2)/(6*g^4*i*(a*d - b*c)^3*(a + b*x)^3) + (A*b^2*c^2)/(3*
g^4*i*(a*d - b*c)^3*(a + b*x)^3) + (85*B*a^2*d^2)/(36*g^4*i*(a*d - b*c)^3*(
a + b*x)^3) + (B*b^2*c^2)/(9*g^4*i*(a*d - b*c)^3*(a + b*x)^3) + (11*B*a^3*d
^3*log((e*(a + b*x))/(c + d*x)))/(6*g^4*i*(a*d - b*c)^4*(a + b*x)^3) - (B*b
^3*c^3*log((e*(a + b*x))/(c + d*x)))/(3*g^4*i*(a*d - b*c)^4*(a + b*x)^3) +
(A*b^2*d^2*x^2)/(g^4*i*(a*d - b*c)^3*(a + b*x)^3) + (11*B*b^2*d^2*x^2)/(6*g
^4*i*(a*d - b*c)^3*(a + b*x)^3) - (7*A*a*b*c*d)/(6*g^4*i*(a*d - b*c)^3*(a +
 b*x)^3) - (23*B*a*b*c*d)/(36*g^4*i*(a*d - b*c)^3*(a + b*x)^3) + (5*A*a*b*d
^2*x)/(2*g^4*i*(a*d - b*c)^3*(a + b*x)^3) + (49*B*a*b*d^2*x)/(12*g^4*i*(a*d
 - b*c)^3*(a + b*x)^3) - (A*b^2*c*d*x)/(2*g^4*i*(a*d - b*c)^3*(a + b*x)^3)
- (5*B*b^2*c*d*x)/(12*g^4*i*(a*d - b*c)^3*(a + b*x)^3) + (3*B*a*b^2*c^2*d*l
og((e*(a + b*x))/(c + d*x)))/(2*g^4*i*(a*d - b*c)^4*(a + b*x)^3) - (3*B*a^2
*b*c*d^2*log((e*(a + b*x))/(c + d*x)))/(g^4*i*(a*d - b*c)^4*(a + b*x)^3) +
(5*B*a^2*b*d^3*x*log((e*(a + b*x))/(c + d*x)))/(2*g^4*i*(a*d - b*c)^4*(a +
b*x)^3) + (B*b^3*c^2*d*x*log((e*(a + b*x))/(c + d*x)))/(2*g^4*i*(a*d - b*c)
^4*(a + b*x)^3) + (B*a*b^2*d^3*x^2*log((e*(a + b*x))/(c + d*x)))/(g^4*i*(a*
d - b*c)^4*(a + b*x)^3) - (B*b^3*c*d^2*x^2*log((e*(a + b*x))/(c + d*x)))/(g
^4*i*(a*d - b*c)^4*(a + b*x)^3) - (3*B*a*b^2*c*d^2*x*log((e*(a + b*x))/(c +
 d*x)))/(g^4*i*(a*d - b*c)^4*(a + b*x)^3)
```

3.39 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=341

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

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

Rubi [A]
time = 0.27, antiderivative size = 341, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$, Rules used = {2562, 2384, 45, 2393, 2332, 2354, 2438}

$$-\frac{3bBg^3(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^2}-\frac{bg^3(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+5B\right)}{2d^4i^2}-\frac{g^3(6A+5B)(a+bx)(bc-ad)^2}{2d^3i^2(c+dx)}-\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right)+3A+B\right)}{2d^2i^2(c+dx)}+\frac{g^3(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2di^2(c+dx)}-\frac{3Bg^3(a+bx)(bc-ad)^2\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^3i^2(c+dx)}+\frac{3Bg^3(a+bx)(bc-ad)^2}{d^3i^2(c+dx)}$$

Antiderivative was successfully verified.

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

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

Rule 45

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

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2354

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

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(39c+39dx)^2}\,dx = \int \left(-\frac{b^2(2bc-3ad)g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1521d^3} + \frac{b^3g^3x\left(A+B\right.}{152}\right.$$

$$= \frac{(b^3g^3)\int x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{1521d^2} - \frac{(b^2(2bc-3ad)g^3)\int\left(A\right.}{1521}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} + \frac{b^3g^3x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3042d^2} + \frac{(bc-}{}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{bB(2bc-3ad)g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{1521d^3}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{bB(2bc-3ad)g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{1521d^3}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{b^2B(bc-ad)g^3x}{3042d^3} - \frac{B(bc-ad)^3g^3}{1521d^4(c+dx)} -$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{b^2B(bc-ad)g^3x}{3042d^3} - \frac{B(bc-ad)^3g^3}{1521d^4(c+dx)} -$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{b^2B(bc-ad)g^3x}{3042d^3} - \frac{B(bc-ad)^3g^3}{1521d^4(c+dx)} -$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{b^2B(bc-ad)g^3x}{3042d^3} - \frac{B(bc-ad)^3g^3}{1521d^4(c+dx)} -$$

Mathematica [A]
time = 0.29, size = 359, normalized size = 1.05

$$\frac{g^3\left(-2Ab^2d(2bc-3ad)x-2bBd(2bc-3ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+b^3d^2x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+\frac{2(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}+2bB(2bc-3ad)(bc-ad)\log(c+dx)+6b(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)-2B(bc-ad)^2\left(\frac{bc-ad}{c+dx}+b\log(a+bx)-b\log(c+dx)\right)+bB(-a^2d^2\log(a+bx)+b(d(-bc+ad)x+bc^2\log(c+dx)))-3bB(bc-ad)^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{2d^4i^2}$$

Antiderivative was successfully verified.

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

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

```
d*x) + b*Log[a + b*x] - b*Log[c + d*x]) + b*B*(-(a^2*d^2*Log[a + b*x]) + b*
(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*b*B*(b*c - a*d)^2*((2*Log[(d
*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])))/(2*d^4*i^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1788 vs. $2(333) = 666$.
time = 1.52, size = 1789, normalized size = 5.25

method	result	size
derivativedivides	Expression too large to display	1789
default	Expression too large to display	1789
risch	Expression too large to display	3868

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1089 vs. $2(315) = 630$.
time = 0.35, size = 1089, normalized size = 3.19

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(2*c^3/(d^5*x + c*d^4) + 6*c^2*log(d*x + c)/d^4 + (d*x^2 - 4*c*x)/d^3)
*A*b^3*g^3 + 3*A*a*b^2*(c^2/(d^4*x + c*d^3) - x/d^2 + 2*c*log(d*x + c)/d^3)
*g^3 - B*a^3*g^3*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d -
a*d^2) - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(d^2*x + c*d) + 1/(d^2*x + c*
d)) - 3*A*a^2*b*g^3*(c/(d^3*x + c*d^2) + log(d*x + c)/d^2) + A*a^3*g^3/(d^2
*x + c*d) - 1/2*(13*b^4*c^3*g^3 - 35*a*b^3*c^2*d*g^3 + 30*a^2*b^2*c*d^2*g^3
 - 6*a^3*b*d^3*g^3)*B*log(d*x + c)/(b*c*d^4 - a*d^5) - 1/2*((b^4*c*d^3*g^3
- a*b^3*d^4*g^3)*B*x^3 - (4*b^4*c^2*d^2*g^3 - 11*a*b^3*c*d^3*g^3 + 7*a^2*b^
2*d^4*g^3)*B*x^2 - (5*b^4*c^3*d*g^3 - 12*a*b^3*c^2*d^2*g^3 + 7*a^2*b^2*c*d^
3*g^3)*B*x - 3*((b^4*c^3*d*g^3 - 3*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3
- a^3*b*d^4*g^3)*B*x + (b^4*c^4*g^3 - 3*a*b^3*c^3*d*g^3 + 3*a^2*b^2*c^2*d^2
*g^3 - a^3*b*c*d^3*g^3)*B)*log(d*x + c)^2 + ((b^4*c*d^3*g^3 - a*b^3*d^4*g^3
)*B*x^3 - 3*(b^4*c^2*d^2*g^3 - 3*a*b^3*c*d^3*g^3 + 2*a^2*b^2*d^4*g^3)*B*x^2
 - (6*b^4*c^3*d*g^3 - 12*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3 + 5*a^3*b*
d^4*g^3)*B*x - (6*a*b^3*c^3*d*g^3 - 15*a^2*b^2*c^2*d^2*g^3 + 11*a^3*b*c*d^3
*g^3)*B)*log(b*x + a) - ((b^4*c*d^3*g^3 - a*b^3*d^4*g^3)*B*x^3 - 3*(b^4*c^2
*d^2*g^3 - 3*a*b^3*c*d^3*g^3 + 2*a^2*b^2*d^4*g^3)*B*x^2 - 2*(2*b^4*c^3*d*g^
3 - 5*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3)*B*x + 2*(b^4*c^4*g^3 - 4*a*b
^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 3*a^3*b*c*d^3*g^3)*B)*log(d*x + c))/
(b*c^2*d^4 - a*c*d^5 + (b*c*d^5 - a*d^6)*x) - 3*(b^3*c^2*g^3 - 2*a*b^2*c*d*
g^3 + a^2*b*d^2*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dil
og(-(b*d*x + a*d)/(b*c - a*d)))*B/d^4
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 3797 vs. 2(315) = 630.
time = 79.57, size = 3797, normalized size = 11.13

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(6*B*b^9*c^5*g^3*e^5*log(b*e - (b*x*e + a*e)*d/(d*x + c)) - 30*B*a*b^8
*c^4*d*g^3*e^5*log(b*e - (b*x*e + a*e)*d/(d*x + c)) + 60*B*a^2*b^7*c^3*d^2*
g^3*e^5*log(b*e - (b*x*e + a*e)*d/(d*x + c)) - 60*B*a^3*b^6*c^2*d^3*g^3*e^5
*log(b*e - (b*x*e + a*e)*d/(d*x + c)) + 30*B*a^4*b^5*c*d^4*g^3*e^5*log(b*e
- (b*x*e + a*e)*d/(d*x + c)) - 6*B*a^5*b^4*d^5*g^3*e^5*log(b*e - (b*x*e + a
*e)*d/(d*x + c)) - 24*(b*x*e + a*e)*B*b^8*c^5*d*g^3*e^4*log(b*e - (b*x*e +
a*e)*d/(d*x + c))/(d*x + c) + 120*(b*x*e + a*e)*B*a*b^7*c^4*d^2*g^3*e^4*log
(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 240*(b*x*e + a*e)*B*a^2*b^6*c
^3*d^3*g^3*e^4*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 240*(b*x*e
+ a*e)*B*a^3*b^5*c^2*d^4*g^3*e^4*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x
+ c) - 120*(b*x*e + a*e)*B*a^4*b^4*c*d^5*g^3*e^4*log(b*e - (b*x*e + a*e)*d/
(d*x + c))/(d*x + c) + 24*(b*x*e + a*e)*B*a^5*b^3*d^6*g^3*e^4*log(b*e - (b*
x*e + a*e)*d/(d*x + c))/(d*x + c) + 36*(b*x*e + a*e)^2*B*b^7*c^5*d^2*g^3*e^
3*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 180*(b*x*e + a*e)^2*B*
a*b^6*c^4*d^3*g^3*e^3*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 36
0*(b*x*e + a*e)^2*B*a^2*b^5*c^3*d^4*g^3*e^3*log(b*e - (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^2 - 360*(b*x*e + a*e)^2*B*a^3*b^4*c^2*d^5*g^3*e^3*log(b*e -
 (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 180*(b*x*e + a*e)^2*B*a^4*b^3*c*d
^6*g^3*e^3*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 36*(b*x*e + a
*e)^2*B*a^5*b^2*d^7*g^3*e^3*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^
2 - 24*(b*x*e + a*e)^3*B*b^6*c^5*d^3*g^3*e^2*log(b*e - (b*x*e + a*e)*d/(d*x
 + c))/(d*x + c)^3 + 120*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g^3*e^2*log(b*e -
```

(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 240*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g^3*e^2*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 240*(b*x*e + a*e)^3*B*a^3*b^3*c^2*d^6*g^3*e^2*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 120*(b*x*e + a*e)^3*B*a^4*b^2*c*d^7*g^3*e^2*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 24*(b*x*e + a*e)^3*B*a^5*b*d^8*g^3*e^2*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 6*(b*x*e + a*e)^4*B*b^5*c^5*d^4*g^3*e*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 30*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*g^3*e*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 60*(b*x*e + a*e)^4*B*a^2*b^3*c^3*d^6*g^3*e*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 60*(b*x*e + a*e)^4*B*a^3*b^2*c^2*d^7*g^3*e*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 30*(b*x*e + a*e)^4*B*a^4*b*c*d^8*g^3*e*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 6*(b*x*e + a*e)^4*B*a^5*d^9*g^3*e*log(b*e - (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 6*(b*x*e + a*e)^4*B*b^5*c^5*d^4*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 30*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 60*(b*x*e + a*e)^4*B*a^2*b^3*c^3*d^6*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 60*(b*x*e + a*e)^4*B*a^3*b^2*c^2*d^7*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 30*(b*x*e + a*e)^4*B*a^4*b*c*d^8*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 6*(b*x*e + a*e)^4*B*a^5*d^9*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 6*A*b^9*c^5*g^3*e^5 + 11*B*b^9*c^5*g^3*e^5 - 30*A*a*b^8*c^4*d*g^3*e^5 - 55*B*a*b^8*c^4*d*g^3*e^5 + 60*A*a^2*b^7*c^3*d^2*g^3*e^5 + 110*B*a^2*b^7*c^3*d^2*g^3*e^5 - 60*A*a^3*b^6*c^2*d^3*g^3*e^5 - 110*B*a^3*b^6*c^2*d^3*g^3*e^5 + 30*A*a^4*b^5*c*d^4*g^3*e^5 + 55*B*a^4*b^5*c*d^4*g^3*e^5 - 6*A*a^5*b^4*d^5*g^3*e^5 - 11*B*a^5*b^4*d^5*g^3*e^5 - 24*(b*x*e + a*e)*A*b^8*c^5*d*g^3*e^4/(d*x + c) - 38*(b*x*e + a*e)*B*b^8*c^5*d*g^3*e^4/(d*x + c) + 120*(b*x*e + a*e)*A*a*b^7*c^4*d^2*g^3*e^4/(d*x + c) + 190*(b*x*e + a*e)*B*a*b^7*c^4*d^2*g^3*e^4/(d*x + c) - 240*(b*x*e + a*e)*A*a^2*b^6*c^3*d^3*g^3*e^4/(d*x + c) - 380*(b*x*e + a*e)*B*a^2*b^6*c^3*d^3*g^3*e^4/(d*x + c) + 240*(b*x*e + a*e)*A*a^3*b^5*c^2*d^4*g^3*e^4/(d*x + c) + 380*(b*x*e + a*e)*B*a^3*b^5*c^2*d^4*g^3*e^4/(d*x + c) - 120*(b*x*e + a*e)*A*a^4*b^4*c*d^5*g^3*e^4/(d*x + c) - 190*(b*x*e + a*e)*B*a^4*b^4*c*d^5*g^3*e^4/(d*x + c) + 24*(b*x*e + a*e)*A*a^5*b^3*d^6*g^3*e^4/(d*x + c) + 38*(b*x*e + a*e)*B*a^5*b^3*d^6*g^3*e^4/(d*x + c) + 36*(b*x*e + a*e)^2*A*b^7*c^5*d^2*g^3*e^3/(d*x + c)^2 + 45*(b*x*e + a*e)^2*B*b^7*c^5*d^2*g^3*e^3/(d*x + c)^2 - 180*(b*x*e + a*e)^2*A*a*b^6*c^4*d^3*g^3*e^3/(d*x + c)^2 - 225*(b*x*e + a*e)^2*B*a*b^6*c^4*d^3*g^3*e^3/(d*x + c)^2 + 360*(b*x*e + a*e)^2*A*a^2*b^5*c^3*d^4*g^3*e^3/(d*x + c)^2 + 450*(b*x*e + a*e)^2*B*a^2*b^5*c^3*d^4*g^3*e^3/(d*x + c)^2 - 360*(b*x*e + a*e)^2*A*a^3*b^4*c^2*d^5*g^3*e^3/(d*x + c)^2 - 450*(b*x*e + a*e)^2*B*a^3*b^4*c^2*d^5*g^3*e^3/(d*x + c)^2 + 180*(b*x*e + a*e)^2*A*a^4*b^3*c*d^6*g^3*e^3/(d*x + c)^2 + 225*(b*x*e + a*e)^2*B*a^4*b^3*c*d^6*g^3*e^3/(d*x + c)^2 - 36*(b*x*e + a*e)^2*A*a^5*b^2*d^7*g^3*e^3/(d*x + c)^2 - 45*(b*x*e + a*e)^2*B*a^5*b^2*d^7*g^3*e^3/(d*x + c)^2 - 24*(b*x*e + a*e)^3*A*b^6*c^5*d^3*g^3*e^2/(d*x + c)^3 - 18*(b*x*e + a*e)^3*B*b^6*c^5*d^3*g^3*e^2/(d*x + c)^3 + 120*(b*x*e + a*e)^3*A*a*b^5*c^4*d^4*g^3*e^2/(d*x + c)^3 + 90*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g^3*e^2/(d*x + c...

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{(c\,i+d\,i\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.40 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=260

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

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

Rubi [A]

time = 0.20, antiderivative size = 260, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$, Rules used = {2562, 2384, 45, 2393, 2332, 2354, 2438}

$$\frac{2bBg^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}+\frac{bg^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+B\right)}{d^3i^2}+\frac{g^2(2A+B)(a+bx)(bc-ad)}{d^2i^2(c+dx)}+\frac{g^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{di^2(c+dx)}+\frac{2Bg^2(a+bx)(bc-ad)\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^2i^2(c+dx)}-\frac{2Bg^2(a+bx)(bc-ad)}{d^2i^2(c+dx)}$$

Antiderivative was successfully verified.

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

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

Rule 45

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

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2354

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

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(40c+40dx)^2}\,dx = \int \left(\frac{b^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1600d^2} + \frac{(-bc+ad)^2g^2\left(A+B\log\left(\right.\right.}{1600d^2(c+dx)^2}\right.$$

$$= \frac{(b^2g^2)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{1600d^2} - \frac{(b(bc-ad)g^2)\int \frac{A+B\log\left(\right.}{c+d}}{800d^2}$$

$$= \frac{Ab^2g^2x}{1600d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1600d^3(c+dx)} - \frac{b(bc-ad)g^2\left(\right.}{}$$

$$= \frac{Ab^2g^2x}{1600d^2} + \frac{bBg^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{1600d^2} - \frac{(bc-ad)^2g^2\left(A+B\,\mathrm{lo}\right.}{1600d^3(c+\right.}$$

$$= \frac{Ab^2g^2x}{1600d^2} + \frac{bBg^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{1600d^2} - \frac{(bc-ad)^2g^2\left(A+B\,\mathrm{lo}\right.}{1600d^3(c+\right.}$$

$$= \frac{Ab^2g^2x}{1600d^2} + \frac{B(bc-ad)^2g^2}{1600d^3(c+dx)} + \frac{bB(bc-ad)g^2\log(a+bx)}{1600d^3} + \frac{bBg}{}$$

$$= \frac{Ab^2g^2x}{1600d^2} + \frac{B(bc-ad)^2g^2}{1600d^3(c+dx)} + \frac{bB(bc-ad)g^2\log(a+bx)}{1600d^3} + \frac{bBg}{}$$

$$= \frac{Ab^2g^2x}{1600d^2} + \frac{B(bc-ad)^2g^2}{1600d^3(c+dx)} + \frac{bB(bc-ad)g^2\log(a+bx)}{1600d^3} + \frac{bBg}{}$$

$$= \frac{Ab^2g^2x}{1600d^2} + \frac{B(bc-ad)^2g^2}{1600d^3(c+dx)} + \frac{bB(bc-ad)g^2\log(a+bx)}{1600d^3} + \frac{bBg}{}$$

Mathematica [A]
time = 0.16, size = 239, normalized size = 0.92

$$\frac{g^2\left(Ab^2dx+\frac{B(bc-ad)^2}{c+dx}+bB(bc-ad)\log(a+bx)+bBd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)-\frac{(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}-2bB(bc-ad)\log(c+dx)-2b(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)+bB(bc-ad)\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{d^3i^2}$$

Antiderivative was successfully verified.

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

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

```
 - a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
+ 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(d^3*i^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 558 vs. $2(260) = 520$.
time = 1.38, size = 559, normalized size = 2.15

method	result
derivativedivides	$-\frac{e(ad-cb)\left(\frac{g^2 A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e^2 i^2}+\frac{2g^2 Ab\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{de\, i^2}+\frac{g^2 A\, b^2}{d\, i^2\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}+\frac{g^2 B\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln(}{e^2 i^2}\right.}{}$
default	$-\frac{e(ad-cb)\left(\frac{g^2 A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e^2 i^2}+\frac{2g^2 Ab\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{de\, i^2}+\frac{g^2 A\, b^2}{d\, i^2\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}+\frac{g^2 B\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln(}{e^2 i^2}\right.}{}$
risch	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 725 vs. $2(247) = 494$.
time = 0.38, size = 725, normalized size = 2.79

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
e/(d*x + c) + a*e/(d*x + c))/(d^2*x + c*d) + 1/(d^2*x + c*d)) - 2*A*a*b*g^2
*(c/(d^3*x + c*d^2) + log(d*x + c)/d^2) + A*a^2*g^2/(d^2*x + c*d) + (4*b^3*
c^2*g^2 - 7*a*b^2*c*d*g^2 + 2*a^2*b*d^2*g^2)*B*log(d*x + c)/(b*c*d^3 - a*d^
4) - ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 + (b^3*c^2*d*g^2 - a*b^2*c*d^2*
g^2)*B*x + ((b^3*c^2*d*g^2 - 2*a*b^2*c*d^2*g^2 + a^2*b*d^3*g^2)*B*x + (b^3*
c^3*g^2 - 2*a*b^2*c^2*d*g^2 + a^2*b*c*d^2*g^2)*B)*log(d*x + c)^2 + ((b^3*c*
d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 + (2*b^3*c^2*d*g^2 - 2*a*b^2*c*d^2*g^2 - a^2
*b*d^3*g^2)*B*x + (2*a*b^2*c^2*d*g^2 - 3*a^2*b*c*d^2*g^2)*B)*log(b*x + a) -
 ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 + (b^3*c^2*d*g^2 - a*b^2*c*d^2*g^2)
*B*x - (b^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 2*a^2*b*c*d^2*g^2)*B)*log(d*x + c
))/(b*c^2*d^3 - a*c*d^4 + (b*c*d^4 - a*d^5)*x) + 2*(b^2*c*g^2 - a*b*d*g^2)*
(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*
c - a*d)))*B/d^3
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 2452 vs. 2(247) = 494.
time = 66.13, size = 2452, normalized size = 9.43

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/6*(2*B*b^7*c^4*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 8*B*a*b^6
*c^3*d*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 12*B*a^2*b^5*c^2*d^2
*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 8*B*a^3*b^4*c*d^3*g^2*e^4*
log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 2*B*a^4*b^3*d^4*g^2*e^4*log(-b*e +
(b*x*e + a*e)*d/(d*x + c)) - 6*(b*x*e + a*e)*B*b^6*c^4*d*g^2*e^3*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 24*(b*x*e + a*e)*B*a*b^5*c^3*d^2*g^
2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 36*(b*x*e + a*e)*B*
a^2*b^4*c^2*d^3*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 2
4*(b*x*e + a*e)*B*a^3*b^3*c*d^4*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c
))/(d*x + c) - 6*(b*x*e + a*e)*B*a^4*b^2*d^5*g^2*e^3*log(-b*e + (b*x*e + a*
e)*d/(d*x + c))/(d*x + c) + 6*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g^2*e^2*log(-b*
e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 24*(b*x*e + a*e)^2*B*a*b^4*c^3
*d^3*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 36*(b*x*e
+ a*e)^2*B*a^2*b^3*c^2*d^4*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
x + c)^2 - 24(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*g^2*e^2*log(-b*e + (b*x*e +
a*e)*d/(d*x + c))/(d*x + c)^2 + 6*(b*x*e + a*e)^2*B*a^4*b*d^6*g^2*e^2*log(-
b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 2*(b*x*e + a*e)^3*B*b^4*c^4*
d^3*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 8*(b*x*e + a*
e)^3*B*a*b^3*c^3*d^4*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^
3 - 12*(b*x*e + a*e)^3*B*a^2*b^2*c^2*d^5*g^2*e*log(-b*e + (b*x*e + a*e)*d/(
d*x + c))/(d*x + c)^3 + 8*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g^2*e*log(-b*e + (b
*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 2*(b*x*e + a*e)^3*B*a^4*d^7*g^2*e*lo
g(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 2*(b*x*e + a*e)^3*B*b^4*c
^4*d^3*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 8*(b*x*e + a*e)^3*B
*a*b^3*c^3*d^4*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 12*(b*x*e +
a*e)^3*B*a^2*b^2*c^2*d^5*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 -
8*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c
)^3 + 2*(b*x*e + a*e)^3*B*a^4*d^7*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x +
c)^3 + 2*A*b^7*c^4*g^2*e^4 + 3*B*b^7*c^4*g^2*e^4 - 8*A*a*b^6*c^3*d*g^2*e^4
- 12*B*a*b^6*c^3*d*g^2*e^4 + 12*A*a^2*b^5*c^2*d^2*g^2*e^4 + 18*B*a^2*b^5*c
^2*d^2*g^2*e^4 - 8*A*a^3*b^4*c*d^3*g^2*e^4 - 12*B*a^3*b^4*c*d^3*g^2*e^4 + 2
*A*a^4*b^3*d^4*g^2*e^4 + 3*B*a^4*b^3*d^4*g^2*e^4 - 6*(b*x*e + a*e)*A*b^6*c^
4*d*g^2*e^3/(d*x + c) - 7*(b*x*e + a*e)*B*b^6*c^4*d*g^2*e^3/(d*x + c) + 24*
(b*x*e + a*e)*A*a*b^5*c^3*d^2*g^2*e^3/(d*x + c) + 28*(b*x*e + a*e)*B*a*b^5*
c^3*d^2*g^2*e^3/(d*x + c) - 36*(b*x*e + a*e)*A*a^2*b^4*c^2*d^3*g^2*e^3/(d*x
+ c) - 42*(b*x*e + a*e)*B*a^2*b^4*c^2*d^3*g^2*e^3/(d*x + c) + 24*(b*x*e +
a*e)*A*a^3*b^3*c*d^4*g^2*e^3/(d*x + c) + 28*(b*x*e + a*e)*B*a^3*b^3*c*d^4*g
^2*e^3/(d*x + c) - 6*(b*x*e + a*e)*A*a^4*b^2*d^5*g^2*e^3/(d*x + c) - 7*(b*x
*e + a*e)*B*a^4*b^2*d^5*g^2*e^3/(d*x + c) + 6*(b*x*e + a*e)^2*A*b^5*c^4*d^2
*g^2*e^2/(d*x + c)^2 + 4*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g^2*e^2/(d*x + c)^2
- 24*(b*x*e + a*e)^2*A*a*b^4*c^3*d^3*g^2*e^2/(d*x + c)^2 - 16*(b*x*e + a*e)
^2*B*a*b^4*c^3*d^3*g^2*e^2/(d*x + c)^2 + 36*(b*x*e + a*e)^2*A*a^2*b^3*c^2*d
^4*g^2*e^2/(d*x + c)^2 + 24*(b*x*e + a*e)^2*B*a^2*b^3*c^2*d^4*g^2*e^2/(d*x
+ c)^2 - 24*(b*x*e + a*e)^2*A*a^3*b^2*c*d^5*g^2*e^2/(d*x + c)^2 - 16*(b*x*e
+ a*e)^2*B*a^3*b^2*c*d^5*g^2*e^2/(d*x + c)^2 + 6*(b*x*e + a*e)^2*A*a^4*b*d

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

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{(c\,i+d\,i\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.41 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=160

$$-\frac{Ag(a+bx)}{di^2(c+dx)}+\frac{Bg(a+bx)}{di^2(c+dx)}-\frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{di^2(c+dx)}-\frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2i^2}-\frac{bBg\mathrm{Li}_2\left(\frac{d(a}{b(c}\right.}{d^2i^2}$$

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

Rubi [A]
time = 0.11, antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2562, 45, 2393, 2332, 2354, 2438}

$$-\frac{bBg\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2}-\frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^2}-\frac{Ag(a+bx)}{di^2(c+dx)}-\frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{di^2(c+dx)}+\frac{Bg(a+bx)}{di^2(c+dx)}$$

Antiderivative was successfully verified.

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

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

Rule 45

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

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2354

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

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

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

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(41c+41dx)^2}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d(c+dx)^2} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{1681d(c+dx)}\right.$$

$$= \frac{(bg)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{1681d} - \frac{((bc-ad)g)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}\,dx}{1681d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(}{1681d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(}{1681d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(}{1681d^2}$$

$$= -\frac{B(bc-ad)g}{1681d^2(c+dx)} - \frac{bBg\log(a+bx)}{1681d^2} + \frac{(bc-ad)g\left(A+B\log\left(\frac{e(}{c}\right.\right.}{1681d^2(c+dx)}$$

$$= -\frac{B(bc-ad)g}{1681d^2(c+dx)} - \frac{bBg\log(a+bx)}{1681d^2} + \frac{(bc-ad)g\left(A+B\log\left(\frac{e(}{c}\right.\right.}{1681d^2(c+dx)}$$

$$= -\frac{B(bc-ad)g}{1681d^2(c+dx)} - \frac{bBg\log(a+bx)}{1681d^2} + \frac{(bc-ad)g\left(A+B\log\left(\frac{e(}{c}\right.\right.}{1681d^2(c+dx)}$$

$$= -\frac{B(bc-ad)g}{1681d^2(c+dx)} - \frac{bBg\log(a+bx)}{1681d^2} + \frac{(bc-ad)g\left(A+B\log\left(\frac{e(}{c}\right.\right.}{1681d^2(c+dx)}$$

Mathematica [A]
time = 0.11, size = 175, normalized size = 1.09

$$\frac{g\left(\frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx} + 2b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx) - 2B\left(\frac{bc-ad}{c+dx} + b\log(a+bx) - b\log(c+dx)\right) - bB\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right) - \log(c+dx)\right)\log(c+dx) + 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{2d^2i^2}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 394 vs. $2(160) = 320$.
time = 1.43, size = 395, normalized size = 2.47

method	result
derivativedivides	$-\frac{e(ad-cb)\left(\frac{gdA\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)e^2i^2}+\frac{gAb\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{(ad-cb)e\,i^2}+\frac{gdB\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)e^2i^2}-\frac{gdB\left(\frac{be}{d}+\frac{(a}{}\right.}{(ad-cb)}\right.}{d^2}$
default	$-\frac{e(ad-cb)\left(\frac{gdA\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)e^2i^2}+\frac{gAb\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{(ad-cb)e\,i^2}+\frac{gdB\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)e^2i^2}-\frac{gdB\left(\frac{be}{d}+\frac{(a}{d(}\right.}{(ad-cb)}\right.}{d^2}$
risch	$-\frac{gAa}{i^2d(dx+c)}+\frac{gAcb}{i^2d^2(dx+c)}+\frac{gAb\ln(dx+c)}{i^2d^2}-\frac{gB\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)ba}{i^2(ad-cb)d}+\frac{gB\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)b^2c}{i^2(ad-cb)d^2}-\frac{gB\ln\left(\frac{be}{d}\right.}{i^2(ad}$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -B*a*g*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^2) - l
og(b*x*e/(d*x + c) + a*e/(d*x + c))/(d^2*x + c*d) + 1/(d^2*x + c*d)) + 1/2*
B*b*g*(((d*x + c)*log(d*x + c)^2 + 2*c*log(d*x + c))/(d^3*x + c*d^2) - 2*in
tegrate((d*x*log(b*x + a) + d*x + c)/(d^3*x^2 + 2*c*d^2*x + c^2*d), x)) - A
*b*g*(c/(d^3*x + c*d^2) + log(d*x + c)/d^2) + A*a*g/(d^2*x + c*d)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 1321 vs. 2(143) = 286.
time = 59.49, size = 1321, normalized size = 8.26

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a\,g+b\,g\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{{(c\,i+d\,i\,x)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x))))/(c*i + d*i*x)^2,x)
```

```
[Out] int(((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x))))/(c*i + d*i*x)^2, x
)
```

3.42 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=98

$$\frac{A(a+bx)}{(bc-ad)i^2(c+dx)}-\frac{B(a+bx)}{(bc-ad)i^2(c+dx)}+\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(bc-ad)i^2(c+dx)}$$

```
[Out] A*(b*x+a)/(-a*d+b*c)/i^2/(d*x+c)-B*(b*x+a)/(-a*d+b*c)/i^2/(d*x+c)+B*(b*x+a)
*ln(e*(b*x+a)/(d*x+c))/(-a*d+b*c)/i^2/(d*x+c)
```

Rubi [A]
time = 0.03, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {2552, 2332}

$$\frac{A(a+bx)}{i^2(c+dx)(bc-ad)}+\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{i^2(c+dx)(bc-ad)}-\frac{B(a+bx)}{i^2(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x)^2,x]
```

```
[Out] (A*(a + b*x))/((b*c - a*d)*i^2*(c + d*x)) - (B*(a + b*x))/((b*c - a*d)*i^2*
(c + d*x)) + (B*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)*i^2*(c
 + d*x))
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2552

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(
m + 1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a
 + b*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && EqQ[n
 + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d, 0] && IntegersQ[m, p] && EqQ[d*f
- c*g, 0] && (GtQ[p, 0] || LtQ[m, -1])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(42c+42dx)^2}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c+dx)} + \frac{B\int\frac{bc-ad}{42(a+bx)(c+dx)^2}\,dx}{42d}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c+dx)} + \frac{(B(bc-ad))\int\frac{1}{(a+bx)(c+dx)^2}\,dx}{1764d}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c+dx)} + \frac{(B(bc-ad))\int\left(\frac{b^2}{(bc-ad)^2(a+bx)} - \frac{d}{(bc-ad)(c+dx)^2} - \frac{}{(bc-ad}\right.}{1764d}$$

$$= \frac{B}{1764d(c+dx)} + \frac{bB\log(a+bx)}{1764d(bc-ad)} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c+dx)} - \frac{bB\log(c+dx)}{1764d(bc-ad)}$$

Mathematica [A]
time = 0.03, size = 104, normalized size = 1.06

$$\frac{Abc-bBc-aAd+aBd-bB(c+dx)\log(a+bx)+B(bc-ad)\log\left(\frac{e(a+bx)}{c+dx}\right)+bBc\log(c+dx)+bBdx\log(c+dx)}{d(-bc+ad)i^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x)^2,x]
```

```
[Out] (A*b*c - b*B*c - a*A*d + a*B*d - b*B*(c + d*x)*Log[a + b*x] + B*(b*c - a*d)
*Log[(e*(a + b*x))/(c + d*x)] + b*B*c*Log[c + d*x] + b*B*d*x*Log[c + d*x])/
(d*(-(b*c) + a*d)*i^2*(c + d*x))
```

Maple [A]
time = 0.51, size = 170, normalized size = 1.73

method	result	s
norman	$\frac{\frac{(A-B)x}{ic}-\frac{aB\ln\left(\frac{e(bx+a)}{dx+c}\right)}{(ad-cb)i}-\frac{Bbx\ln\left(\frac{e(bx+a)}{dx+c}\right)}{(ad-cb)i}}{i(dx+c)}$	9
risch	$-\frac{B\ln\left(\frac{e(bx+a)}{dx+c}\right)}{d\,i^2(dx+c)}-\frac{-B\ln(-dx-c)bdx+B\ln(bx+a)bdx-B\ln(-dx-c)bc+B\ln(bx+a)bc+Aad-Abc-Bad+Bbc}{i^2(dx+c)d(ad-cb)}$	1
derivativedivides	$-\frac{e(ad-cb)\left(\frac{d^2A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)^2e^2i^2}+\frac{d^2B\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)-\frac{(ad-cb)e}{d(dx+c)}-\frac{be}{d}\right)}{(ad-cb)^2e^2i^2}\right)}{d^2}$	1
default	$-\frac{e(ad-cb)\left(\frac{d^2A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)^2e^2i^2}+\frac{d^2B\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)-\frac{(ad-cb)e}{d(dx+c)}-\frac{be}{d}\right)}{(ad-cb)^2e^2i^2}\right)}{d^2}$	1

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(d^2/(a*d-b*c)^2/e^2/i^2*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))
+d^2/(a*d-b*c)^2/e^2/i^2*B*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d))
```

Maxima [A]
time = 0.28, size = 110, normalized size = 1.12

$$-B\left(\frac{b\log\left(bx+a\right)}{bcd-ad^2}-\frac{b\log\left(dx+c\right)}{bcd-ad^2}-\frac{\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)}{d^2x+cd}+\frac{1}{d^2x+cd}\right)+\frac{A}{d^2x+cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="maxima")
```

```
[Out] -B*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^2) - log(b
*x*e/(d*x + c) + a*e/(d*x + c))/(d^2*x + c*d) + 1/(d^2*x + c*d)) + A/(d^2*x
 + c*d)
```

Fricas [A]
time = 0.36, size = 78, normalized size = 0.80

$$\frac{(A-B)bc-(A-B)ad-(Bbdx+Bad)\log\left(\frac{(bx+a)e}{dx+c}\right)}{bc^2d-acd^2+(bcd^2-ad^3)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="fricas")
```

```
[Out] ((A - B)*b*c - (A - B)*a*d - (B*b*d*x + B*a*d)*log((b*x + a)*e/(d*x + c)))/
(b*c^2*d - a*c*d^2 + (b*c*d^2 - a*d^3)*x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 231 vs. $2(78) = 156$.
time = 0.71, size = 231, normalized size = 2.36

$$\frac{Bb\log\left(x+\frac{-\frac{Ba^2bd^2}{ad-bc}+\frac{2Bab^2cd}{ad-bc}+Babd-\frac{Bb^3c^2}{ad-bc}+Bb^2c}{2Bb^2d}\right)}{di^2\left(ad-bc\right)}-\frac{Bb\log\left(x+\frac{\frac{Ba^2bd^2}{ad-bc}-\frac{2Bab^2cd}{ad-bc}+Babd+\frac{Bb^3c^2}{ad-bc}+Bb^2c}{2Bb^2d}\right)}{di^2\left(ad-bc\right)}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{cdi^2+d^2i^2x}+\frac{-A+B}{cdi^2+d^2i^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**2,x)
```

```
[Out] B*b*log(x + (-B*a**2*b*d**2/(a*d - b*c) + 2*B*a*b**2*c*d/(a*d - b*c) + B*a*
b*d - B*b**3*c**2/(a*d - b*c) + B*b**2*c)/(2*B*b**2*d))/(d*i**2*(a*d - b*c)
) - B*b*log(x + (B*a**2*b*d**2/(a*d - b*c) - 2*B*a*b**2*c*d/(a*d - b*c) + B
*a*b*d + B*b**3*c**2/(a*d - b*c) + B*b**2*c)/(2*B*b**2*d))/(d*i**2*(a*d - b
```

```
*c)) - B*log(e*(a + b*x)/(c + d*x))/(c*d*i**2 + d**2*i**2*x) + (-A + B)/(c*
d*i**2 + d**2*i**2*x)
```

Giac [A]
time = 4.07, size = 120, normalized size = 1.22

$$-\left(\frac{(bxe+ae)B\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{(bxe+ae)(A-B)}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] -((b*x*e + a*e)*B*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + (b*x*e + a*e)*(A
 - B)/(d*x + c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*
(b*c - a*d)))
```

Mupad [B]
time = 4.89, size = 106, normalized size = 1.08

$$-\frac{A-B}{x\,d^2\,i^2+c\,d\,i^2}-\frac{B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{d^2\,i^2\,\left(x+\frac{c}{d}\right)}+\frac{B\,b\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,2\mathrm{i}}{d\,i^2\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(c*i + d*i*x)^2,x)
```

```
[Out] (B*b*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*2i)/(d*i^2*(a*d - b*c)) - (
B*log((e*(a + b*x))/(c + d*x)))/(d^2*i^2*(x + c/d)) - (A - B)/(d^2*i^2*x +
c*d*i^2)
```

3.43 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)^2}\,dx$

Optimal. Leaf size=156

$$-\frac{Ad(a+bx)}{(bc-ad)^2gi^2(c+dx)}+\frac{Bd(a+bx)}{(bc-ad)^2gi^2(c+dx)}-\frac{Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(bc-ad)^2gi^2(c+dx)}+\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2B(bc-ad)^2gi^2}$$

```
[Out] -A*d*(b*x+a)/(-a*d+b*c)^2/g/i^2/(d*x+c)+B*d*(b*x+a)/(-a*d+b*c)^2/g/i^2/(d*x
+c)-B*d*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/(-a*d+b*c)^2/g/i^2/(d*x+c)+1/2*b*(A+B
*ln(e*(b*x+a)/(d*x+c)))^2/B/(-a*d+b*c)^2/g/i^2
```

Rubi [A]
time = 0.11, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 2388, 2338, 2332}

$$\frac{b\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2Bgi^2(bc-ad)^2}-\frac{Ad(a+bx)}{gi^2(c+dx)(bc-ad)^2}-\frac{Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{gi^2(c+dx)(bc-ad)^2}+\frac{Bd(a+bx)}{gi^2(c+dx)(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)^2),x]
```

```
[Out] -((A*d*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x))) + (B*d*(a + b*x))/((b*c
- a*d)^2*g*i^2*(c + d*x)) - (B*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((
b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(2*B*(b*c - a*d)^2*g*i^2)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2388

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[(d + e*x)^(q - 1)*((a + b*Log[c*x^n])^p/x),
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(43c+43dx)^2(ag+bgx)}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)^2g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)g(c+dx)^2} - \frac{bd\left(A+B\log\right.}{1849(bc-a}\right.$$

$$= \frac{b^2\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{1849(bc-ad)^2g} - \frac{(bd)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{1849(bc-ad)^2g} - \frac{d\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}\,d}{1849(bc-ad)g}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)^2g} - \frac{b\left(A+\right.}{}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)^2g} - \frac{b\left(A+\right.}{}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)^2g} - \frac{b\left(A+\right.}{}$$

$$= -\frac{B}{1849(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)}{1849(bc-ad)^2g} + \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)}$$

$$= -\frac{B}{1849(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)}{1849(bc-ad)^2g} + \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)}$$

$$= -\frac{B}{1849(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)}{1849(bc-ad)^2g} - \frac{bB\log^2(a+bx)}{3698(bc-ad)^2g} + \frac{A+}{1849}$$

$$= -\frac{B}{1849(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)}{1849(bc-ad)^2g} - \frac{bB\log^2(a+bx)}{3698(bc-ad)^2g} + \frac{A+}{1849}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.19, size = 292, normalized size = 1.87

$$\frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+2b(c+dx)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-2b(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)-2B(bc-ad+b(c+dx)\log(a+bx)-b(c+dx)\log(c+dx))-bB(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+bB(c+dx)\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{2(bc-ad)^2gi^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)
^2),x]
```

```
[Out] (2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b*(c + d*x)*Log[a +
 b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*b*(c + d*x)*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])*Log[c + d*x] - 2*B*(b*c - a*d + b*(c + d*x)*Log[a + b*
x] - b*(c + d*x)*Log[c + d*x]) - b*B*(c + d*x)*(Log[a + b*x]*(Log[a + b*x]
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) + b*B*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x]
)*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(2*(b*c - a*d)^2
*g*i^2*(c + d*x))
```

Maple [A]
time = 0.65, size = 286, normalized size = 1.83

method	result
norman	$\frac{\frac{(Abc-Bad)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{gi\left(a^2d^2-2abcd+b^2c^2\right)}+\frac{d(Ab-Bb)x\ln\left(\frac{e(bx+a)}{dx+c}\right)}{gi\left(a^2d^2-2abcd+b^2c^2\right)}+\frac{(A-B)dx}{gic(ad-cb)}+\frac{Bbc\ln\left(\frac{e(bx+a)}{dx+c}\right)^2}{2gi\left(a^2d^2-2abcd+b^2c^2\right)}+\frac{bBdx\ln\left(\frac{e(bx+a)}{dx+c}\right)^2}{2gi\left(a^2d^2-2abcd+b^2c^2\right)}}{i(dx+c)}$
derivativedivides	$-\frac{e(ad-cb)\left(-\frac{d^2Ab\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e\,i^2(ad-cb)^3g}+\frac{d^3A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e^2i^2(ad-cb)^3g}-\frac{d^2Bb\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2e\,i^2(ad-cb)^3g}+\frac{d^3B\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\cdots\right.\right.}{e^2i^2(ad-cb\cdots}\right.}{d^2}$
default	$-\frac{e(ad-cb)\left(-\frac{d^2Ab\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e\,i^2(ad-cb)^3g}+\frac{d^3A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{e^2i^2(ad-cb)^3g}-\frac{d^2Bb\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2e\,i^2(ad-cb)^3g}+\frac{d^3B\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\cdots\right.\right.}{e^2i^2(ad-cb\cdots}\right.}{d^2}$
risch	$-\frac{A}{g\,i^2(ad-cb)(dx+c)}-\frac{Ab\ln(dx+c)}{g\,i^2(ad-cb)^2}+\frac{Ab\ln(bx+a)}{g\,i^2(ad-cb)^2}-\frac{B\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)b}{g\,i^2(ad-cb)^2}-\frac{Bd\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)a}{g\,i^2(ad-cb)^2(dx+c)}+\frac{B\ln\left(\cdots\right.}{g\,i^2(\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x,method=_RETURNV
ERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-d^2/e/i^2/(a*d-b*c)^3/g*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))+d^3/e^2/i^2/(a*d-b*c)^3/g*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/2*d^2/e/i
^2/(a*d-b*c)^3/g*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+d^3/e^2/i^2/(a*d-b*c
)^3/g*B*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d
-b*c)*e/d/(d*x+c)-b*e/d))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 383 vs. $2(143) = 286$.

time = 0.30, size = 383, normalized size = 2.46

$$-B\left(\frac{b\log\left(bx+a\right)}{(b^2c^2-2\,abcd+a^2d^2)g}-\frac{b\log\left(dx+c\right)}{(b^2c^2-2\,abcd+a^2d^2)g}+\frac{1}{(bcd-ad^2)gx+(bc^2-acd)g}\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)-A\left(\frac{b\log\left(bx+a\right)}{(b^2c^2-2\,abcd+a^2d^2)g}-\frac{b\log\left(dx+c\right)}{(b^2c^2-2\,abcd+a^2d^2)g}+\frac{1}{(bcd-ad^2)gx+(bc^2-acd)g}\right)+\frac{\left((bdx+bc)\log\left(bx+a\right)^2+(bdx+bc)\log\left(dx+c\right)^2+2\,bc-2\,ad+2\,(bdx+bc)\log\left(bx+a\right)-2\,(bdx+bc+(bdx+bc)\log\left(bx+a\right))\log\left(dx+c\right)\right)B}{2\,(b^2c^3g-2\,abc^2dg+a^2cd^2g+(b^2c^2dg-2\,abcd^2g+a^2d^3g)x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algorit
hm="maxima")
```

```
[Out] -B*(b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) - b*log(d*x + c)/((b
^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) + 1/((b*c*d - a*d^2)*g*x + (b*c^2 - a*c*d)
*g))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - A*(b*log(b*x + a)/((b^2*c^2 - 2
*a*b*c*d + a^2*d^2)*g) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g)
 + 1/((b*c*d - a*d^2)*g*x + (b*c^2 - a*c*d)*g)) + 1/2*((b*d*x + b*c)*log(b*
x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*l
og(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*B/
(b^2*c^3*g - 2*a*b*c^2*d*g + a^2*c*d^2*g + (b^2*c^2*d*g - 2*a*b*c*d^2*g + a
^2*d^3*g)*x)
```

Fricas [A]
time = 0.37, size = 143, normalized size = 0.92

$$-\frac{2\,(A-B)bc-2\,(A-B)ad+(Bbdx+Bbc)\log\left(\frac{(bx+a)e}{dx+c}\right)^2+2\,((A-B)bdx+Abc-Bad)\log\left(\frac{(bx+a)e}{dx+c}\right)}{2\,((b^2c^2d-2\,abcd^2+a^2d^3)gx+(b^2c^3-2\,abc^2d+a^2cd^2)g)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algorit
hm="fricas")
```

```
[Out] -1/2*(2*(A - B)*b*c - 2*(A - B)*a*d + (B*b*d*x + B*b*c)*log((b*x + a)*e/(d*
x + c))^2 + 2*((A - B)*b*d*x + A*b*c - B*a*d)*log((b*x + a)*e/(d*x + c)))/(
(b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g*x + (b^2*c^3 - 2*a*b*c^2*d + a^2*c*d^
2)*g)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 386 vs. $2(131) = 262$.
time = 0.68, size = 386, normalized size = 2.47

$$\frac{Bb\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2a^2d^2gi^2-4abcdgi^2+2b^2c^2gi^2}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{acdgi^2+ad^2gi^2x-bc^2gi^2-bcdgi^2x}+(A-B)\left(-\frac{b\log\left(x+\frac{-\frac{a^3bd^3}{(ad-bc)^2}+\frac{3a^2b^2cd^2}{(ad-bc)^2}-\frac{3ab^3c^2d}{(ad-bc)^2}+abd+\frac{b^4c^3}{(ad-bc)^2}+b^2c}{2b^2d}\right)}{gi^2\left(ad-bc\right)^2}+\frac{b\log\left(x+\frac{\frac{a^3bd^3}{(ad-bc)^2}-\frac{3a^2b^2cd^2}{(ad-bc)^2}+\frac{3ab^3c^2d}{(ad-bc)^2}+abd-\frac{b^4c^3}{(ad-bc)^2}+b^2c}{2b^2d}\right)}{gi^2\left(ad-bc\right)^2}-\frac{1}{acdgi^2-bc^2gi^2+x\left(ad^2gi^2-bcdgi^2\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)**2,x)
```

```
[Out] B*b*log(e*(a + b*x)/(c + d*x))**2/(2*a**2*d**2*g*i**2 - 4*a*b*c*d*g*i**2 +
2*b**2*c**2*g*i**2) - B*log(e*(a + b*x)/(c + d*x))/(a*c*d*g*i**2 + a*d**2*g
```

```
*i**2*x - b*c**2*g*i**2 - b*c*d*g*i**2*x) + (A - B)*(-b*log(x + (-a**3*b*d*
*3/(a*d - b*c)**2 + 3*a**2*b**2*c*d**2/(a*d - b*c)**2 - 3*a*b**3*c**2*d/(a*
d - b*c)**2 + a*b*d + b**4*c**3/(a*d - b*c)**2 + b**2*c)/(2*b**2*d))/(g*i**
2*(a*d - b*c)**2) + b*log(x + (a**3*b*d**3/(a*d - b*c)**2 - 3*a**2*b**2*c*d
**2/(a*d - b*c)**2 + 3*a*b**3*c**2*d/(a*d - b*c)**2 + a*b*d - b**4*c**3/(a*
d - b*c)**2 + b**2*c)/(2*b**2*d))/(g*i**2*(a*d - b*c)**2) - 1/(a*c*d*g*i**2
 - b*c**2*g*i**2 + x*(a*d**2*g*i**2 - b*c*d*g*i**2)))
```

Giac [A]
time = 3.89, size = 204, normalized size = 1.31

$$-\frac{\left(Bbe\log\left(\frac{bxe+ae}{dx+c}\right)^2+2\,Abe\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{2\,(bxe+ae)Bd\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{2\,(bxe+ae)Ad}{dx+c}+\frac{2\,(bxe+ae)Bd}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{2\,(bcg-adg)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algorit
hm="giac")
```

```
[Out] -1/2*(B*b*e*log((b*x*e + a*e)/(d*x + c))^2 + 2*A*b*e*log((b*x*e + a*e)/(d*x
 + c)) - 2*(b*x*e + a*e)*B*d*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 2*(b*
x*e + a*e)*A*d/(d*x + c) + 2*(b*x*e + a*e)*B*d/(d*x + c))*(b*c/((b*c*e - a*
d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b*c*g - a*d*g)
```

Mupad [B]
time = 5.81, size = 247, normalized size = 1.58

$$\frac{B\,b\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2}{2\,g\,i^2\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{A-B}{\left(a\,d-b\,c\right)\,\left(c\,g\,i^2+d\,g\,i^2\,x\right)}-\frac{B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\,\left(a\,d-b\,c\right)}{b\,d\,g\,i^2\,\left(\frac{x}{b}+\frac{c}{b\,d}\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{b\,\mathrm{atan}\left(\frac{\left(2\,b\,d\,x+\frac{a^2\,d^2\,g\,i^2-b^2\,c^2\,g\,i^2}{g\,i^2\,(a\,d-b\,c)}\right)\,1\mathrm{i}}{a\,d-b\,c}\right)\,\left(A-B\right)\,2\mathrm{i}}{g\,i^2\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/((a*g + b*g*x)*(c*i + d*i*x)^2),x)
```

```
[Out] (B*b*log((e*(a + b*x))/(c + d*x))^2)/(2*g*i^2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*
d)) - (b*atan(((2*b*d*x + (a^2*d^2*g*i^2 - b^2*c^2*g*i^2)/(g*i^2*(a*d - b*c
)))*1i)/(a*d - b*c))*(A - B)*2i)/(g*i^2*(a*d - b*c)^2) - (A - B)/((a*d - b*
c)*(c*g*i^2 + d*g*i^2*x)) - (B*log((e*(a + b*x))/(c + d*x))*(a*d - b*c))/(b
*d*g*i^2*(x/b + c/(b*d))*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))
```

3.44 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)^2}\,dx$

Optimal. Leaf size=261

$$-\frac{Bd^2(a+bx)}{(bc-ad)^3g^2i^2(c+dx)}-\frac{b^2B(c+dx)}{(bc-ad)^3g^2i^2(a+bx)}+\frac{bBd\log^2\left(\frac{a+bx}{c+dx}\right)}{(bc-ad)^3g^2i^2}+\frac{d^2(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^3g^2i^2(c+dx)}-\frac{b^2}{}$$

```
[Out] -B*d^2*(b*x+a)/(-a*d+b*c)^3/g^2/i^2/(d*x+c)-b^2*B*(d*x+c)/(-a*d+b*c)^3/g^2/
i^2/(b*x+a)+b*B*d*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^3/g^2/i^2+d^2*(b*x+a)*(A
+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^2/i^2/(d*x+c)-b^2*(d*x+c)*(A+B*ln(
e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^2/i^2/(b*x+a)-2*b*d*ln((b*x+a)/(d*x+c))*
(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^2/i^2
```

Rubi [A]
time = 0.14, antiderivative size = 261, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 45, 2372, 2338}

$$-\frac{b^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^2(a+bx)(bc-ad)^3}+\frac{d^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^2(c+dx)(bc-ad)^3}-\frac{2bd\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^2(bc-ad)^3}-\frac{b^2B(c+dx)}{g^2i^2(a+bx)(bc-ad)^3}-\frac{Bd^2(a+bx)}{g^2i^2(c+dx)(bc-ad)^3}+\frac{bBd\log^2\left(\frac{a+bx}{c+dx}\right)}{g^2i^2(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*x)^2),
x]
```

```
[Out] -((B*d^2*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x))) - (b^2*B*(c + d*x))/
((b*c - a*d)^3*g^2*i^2*(a + b*x)) + (b*B*d*Log[(a + b*x)/(c + d*x)]^2)/((b*
c - a*d)^3*g^2*i^2) + (d^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (b^2*(c + d*x)*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*b*d*Log[(a + b*x)/(c +
 d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(44c+44dx)^2(ag+bgx)^2}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)^2} - \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{968(bc-ad)^3g^2(a+bx)} + \frac{d^2\left(A+\right.}{1936(bc}\right.$$

$$= -\frac{(b^2d)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{968(bc-ad)^3g^2} + \frac{(bd^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{968(bc-ad)^3g^2} + \frac{b^2\int \frac{A+B\log\left(\frac{e}{}\right.}{(a+bx}}{1936(bc-}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a+bx}{96}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a+bx}{96}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a+bx}{96}$$

$$= -\frac{bB}{1936(bc-ad)^2g^2(a+bx)} + \frac{Bd}{1936(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\right.}{1936(bc-ad}$$

$$= -\frac{bB}{1936(bc-ad)^2g^2(a+bx)} + \frac{Bd}{1936(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\right.}{1936(bc-ad}$$

$$= -\frac{bB}{1936(bc-ad)^2g^2(a+bx)} + \frac{Bd}{1936(bc-ad)^2g^2(c+dx)} + \frac{bBd\log^2(a+}{1936(bc-ad}$$

$$= -\frac{bB}{1936(bc-ad)^2g^2(a+bx)} + \frac{Bd}{1936(bc-ad)^2g^2(c+dx)} + \frac{bBd\log^2(a+}{1936(bc-ad}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.29, size = 324, normalized size = 1.24

$$\frac{-\frac{b^2Bc}{a+bx}+\frac{abBd}{a+bx}+\frac{bBcd}{c+dx}-\frac{aBd^2}{c+dx}-\frac{b(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx}+\frac{d(-bc+ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}-2bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+2bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)+bBd\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)-bBd\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{(bc-ad)^3g^2i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*
x)^2),x]
```

```
[Out] (-((b^2*B*c)/(a + b*x)) + (a*b*B*d)/(a + b*x) + (b*B*c*d)/(c + d*x) - (a*B*
d^2)/(c + d*x) - (b*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a +
b*x) + (d*(-(b*c) + a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) -
2*b*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b*d*(A + B*Log[
```

```
(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + b*B*d*(Log[a + b*x]*(Log[a + b*x]
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) - b*B*d*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c
+ d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^3*g^2*i^2)
```

Maple [A]
time = 0.64, size = 455, normalized size = 1.74 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-d^2/i^2/(a*d-b*c)^4/g^2*A*b^2/(b*e/d+(a*d-b*c)*e/d/(d*
x+c))-2*d^3/e/i^2/(a*d-b*c)^4/g^2*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d^4/e
^2/i^2/(a*d-b*c)^4/g^2*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d^2/i^2/(a*d-b*c)^4/
g^2*B*b^2*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))-d^3/e/i^2/(a*d-b*c)^4/g^2*B*b*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2+d^4/e^2/i^2/(a*d-b*c)^4/g^2*B*((b*e/d+(a*d-b*c)*e/d/
(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 792 vs. 2(245) = 490.
time = 0.32, size = 792, normalized size = 3.03

$$B\left(\frac{2\,bdx + bc + ad}{{\left(b^{3}c^{2}d - 2\,ab^{2}cd^{2} + a^{2}bd^{3}\right)}g^{2}x^{2} + {\left(b^{3}c^{3} - ab^{2}c^{2}d - a^{2}bcd^{2} + a^{3}d^{3}\right)}g^{2}x + {\left(ab^{2}c^{3} - 2\,a^{2}bc^{2}d + a^{3}cd^{2}\right)}g^{2}} + \frac{2\,bd\log\left(bx + a\right)}{{\left(b^{3}c^{3} - 3\,ab^{2}c^{2}d + 3\,a^{2}bcd^{2} - a^{3}d^{3}\right)}g^{2}} - \frac{2\,bd\log\left(dx + c\right)}{{\left(b^{3}c^{3} - 3\,ab^{2}c^{2}d + 3\,a^{2}bcd^{2} - a^{3}d^{3}\right)}g^{2}}\right)\log\left(\frac{bxe}{dx + c} + \frac{ae}{dx + c}\right) + A\left(\frac{2\,bdx + bc + ad}{{\left(b^{3}c^{2}d - 2\,ab^{2}cd^{2} + a^{2}bd^{3}\right)}g^{2}x^{2} + {\left(b^{3}c^{3} - ab^{2}c^{2}d - a^{2}bcd^{2} + a^{3}d^{3}\right)}g^{2}x + {\left(ab^{2}c^{3} - 2\,a^{2}bc^{2}d + a^{3}cd^{2}\right)}g^{2}} + \frac{2\,bd\log\left(bx + a\right)}{{\left(b^{3}c^{3} - 3\,ab^{2}c^{2}d + 3\,a^{2}bcd^{2} - a^{3}d^{3}\right)}g^{2}} - \frac{2\,bd\log\left(dx + c\right)}{{\left(b^{3}c^{3} - 3\,ab^{2}c^{2}d + 3\,a^{2}bcd^{2} - a^{3}d^{3}\right)}g^{2}}\right) + \frac{{\left(b^{2}c^{2} - 2\,abcd + a^{2}d^{2} - {\left(b^{2}d^{2}x^{2} + abcd + {\left(b^{2}cd + abd^{2}\right)}x\right)}\log\left(bx + a\right)^{2} + 2\,{\left(b^{2}d^{2}x^{2} + abcd + {\left(b^{2}cd + abd^{2}\right)}x\right)}\log\left(bx + a\right)\log\left(dx + c\right) - {\left(b^{2}d^{2}x^{2} + abcd + {\left(b^{2}cd + abd^{2}\right)}x\right)}\log\left(dx + c\right)^{2}\right)}B}{ab^{3}c^{4}g^{2} - 3\,a^{2}b^{2}c^{3}dg^{2} + 3\,a^{3}bc^{2}d^{2}g^{2} - a^{4}cd^{3}g^{2} + {\left(b^{4}c^{3}dg^{2} - 3\,ab^{3}c^{2}d^{2}g^{2} + 3\,a^{2}b^{2}cd^{3}g^{2} - a^{3}bd^{4}g^{2}\right)}x^{2} + {\left(b^{4}c^{4}g^{2} - 2\,ab^{3}c^{3}dg^{2} + 2\,a^{3}bcd^{3}g^{2} - a^{4}d^{4}g^{2}\right)}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*x^2 +
 (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*x + (a*b^2*c^3 - 2*a^2
*b*c^2*d + a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d +
 3*a^2*b*c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) +
A*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*x^2 +
 (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*x + (a*b^2*c^3 - 2*a^2
*b*c^2*d + a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d +
 3*a^2*b*c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2)) + (b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2
*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2
 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c) - (b^2*d^2*x^
2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*B/(a*b^3*c^4*g^2 - 3*a
^2*b^2*c^3*d*g^2 + 3*a^3*b*c^2*d^2*g^2 - a^4*c*d^3*g^2 + (b^4*c^3*d*g^2 - 3
*a*b^3*c^2*d^2*g^2 + 3*a^2*b^2*c*d^3*g^2 - a^3*b*d^4*g^2)*x^2 + (b^4*c^4*g^
2 - 2*a*b^3*c^3*d*g^2 + 2*a^3*b*c*d^3*g^2 - a^4*d^4*g^2)*x)
```

Fricas [A]
time = 0.46, size = 322, normalized size = 1.23

$$\frac{(A+B)b^2c^2 - 2\,Babcd - (A-B)a^2d^2 + (Bb^2d^2x^2 + Babcd + (Bb^2cd + Babd^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)^2 + 2\,(Ab^2cd - Aabd^2)x + (2\,Ab^2d^2x^2 + Bb^2c^2 + 2\,Aabcd - Ba^2d^2 + 2\,((A+B)b^2cd + (A-B)abd^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{(b^4c^3d - 3\,ab^3c^2d^2 + 3\,a^2b^2cd^3 - a^3bd^4)g^2x^2 + (b^4c^4 - 2\,ab^3c^3d + 2\,a^3bcd^3 - a^4d^4)g^2x + (ab^3c^4 - 3\,a^2b^2c^3d + 3\,a^3bc^2d^2 - a^4cd^3)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] ((A + B)*b^2*c^2 - 2*B*a*b*c*d - (A - B)*a^2*d^2 + (B*b^2*d^2*x^2 + B*a*b*c
*d + (B*b^2*c*d + B*a*b*d^2)*x)*log((b*x + a)*e/(d*x + c))^2 + 2*(A*b^2*c*d
 - A*a*b*d^2)*x + (2*A*b^2*d^2*x^2 + B*b^2*c^2 + 2*A*a*b*c*d - B*a^2*d^2 +
2*((A + B)*b^2*c*d + (A - B)*a*b*d^2)*x)*log((b*x + a)*e/(d*x + c)))/((b^4*
c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^2*x^2 + (b^4*c^4 -
 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 - a^4*d^4)*g^2*x + (a*b^3*c^4 - 3*a^2*b^2*c^
3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3)*g^2)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 828 vs. $2(235) = 470$.
time = 2.35, size = 828, normalized size = 3.17

$$-\frac{2Abd\log\left(x+\frac{-\frac{2Aa^4bd^5}{(ad-bc)^3}+\frac{8Aa^3b^2cd^4}{(ad-bc)^3}-\frac{12Aa^2b^3c^2d^3}{(ad-bc)^3}+\frac{8Aab^4c^3d^2}{(ad-bc)^3}+2Aabd^2-\frac{2Ab^5c^4d}{(ad-bc)^3}+2Ab^2cd}{4Ab^2d^2}\right)}{g^2i^2(ad-bc)^3}+\frac{2Abd\log\left(x+\frac{\frac{2Aa^4bd^5}{(ad-bc)^3}-\frac{8Aa^3b^2cd^4}{(ad-bc)^3}+\frac{12Aa^2b^3c^2d^3}{(ad-bc)^3}-\frac{8Aab^4c^3d^2}{(ad-bc)^3}+2Aabd^2+\frac{2Ab^5c^4d}{(ad-bc)^3}+2Ab^2cd}{4Ab^2d^2}\right)}{g^2i^2(ad-bc)^3}+\frac{Bbd\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{a^3d^3g^2i^2-3a^2bcd^2g^2i^2+3ab^2c^2dg^2i^2-b^3c^3g^2i^2}+\frac{(-Bad-Bbc-2Bbdx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{a^3cd^2g^2i^2+a^3d^3g^2i^2x-2a^2bc^2dg^2i^2-a^2bcd^2g^2i^2x+a^2bd^3g^2i^2x^2+ab^2c^3g^2i^2-ab^2c^2dg^2i^2x-2ab^2cd^2g^2i^2x^2+b^3c^3g^2i^2x+b^3c^2dg^2i^2x^2}-\frac{Aad+Abc+2Abdx-Bad+Bbc}{a^3cd^2g^2i^2-2a^2bc^2dg^2i^2+ab^2c^3g^2i^2+x^2(a^2bd^3g^2i^2-2ab^2cd^2g^2i^2+b^3c^2dg^2i^2)+x(a^3d^3g^2i^2-a^2bcd^2g^2i^2-ab^2c^2dg^2i^2+b^3c^3g^2i^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2/(d*i*x+c*i)**2,x)
```

```
[Out] -2*A*b*d*log(x + (-2*A*a**4*b*d**5/(a*d - b*c)**3 + 8*A*a**3*b**2*c*d**4/(a
*d - b*c)**3 - 12*A*a**2*b**3*c**2*d**3/(a*d - b*c)**3 + 8*A*a*b**4*c**3*d*
*2/(a*d - b*c)**3 + 2*A*a*b*d**2 - 2*A*b**5*c**4*d/(a*d - b*c)**3 + 2*A*b**
2*c*d)/(4*A*b**2*d**2))/(g**2*i**2*(a*d - b*c)**3) + 2*A*b*d*log(x + (2*A*a
**4*b*d**5/(a*d - b*c)**3 - 8*A*a**3*b**2*c*d**4/(a*d - b*c)**3 + 12*A*a**2
*b**3*c**2*d**3/(a*d - b*c)**3 - 8*A*a*b**4*c**3*d**2/(a*d - b*c)**3 + 2*A*
a*b*d**2 + 2*A*b**5*c**4*d/(a*d - b*c)**3 + 2*A*b**2*c*d)/(4*A*b**2*d**2))/
(g**2*i**2*(a*d - b*c)**3) + B*b*d*log(e*(a + b*x)/(c + d*x))**2/(a**3*d**3
*g**2*i**2 - 3*a**2*b*c*d**2*g**2*i**2 + 3*a*b**2*c**2*d*g**2*i**2 - b**3*c
**3*g**2*i**2) + (-B*a*d - B*b*c - 2*B*b*d*x)*log(e*(a + b*x)/(c + d*x))/(a
**3*c*d**2*g**2*i**2 + a**3*d**3*g**2*i**2*x - 2*a**2*b*c**2*d*g**2*i**2 -
a**2*b*c*d**2*g**2*i**2*x + a**2*b*d**3*g**2*i**2*x**2 + a*b**2*c**3*g**2*i
**2 - a*b**2*c**2*d*g**2*i**2*x - 2*a*b**2*c*d**2*g**2*i**2*x**2 + b**3*c**
3*g**2*i**2*x + b**3*c**2*d*g**2*i**2*x**2) - (A*a*d + A*b*c + 2*A*b*d*x -
B*a*d + B*b*c)/(a**3*c*d**2*g**2*i**2 - 2*a**2*b*c**2*d*g**2*i**2 + a*b**2*
c**3*g**2*i**2 + x**2*(a**2*b*d**3*g**2*i**2 - 2*a*b**2*c*d**2*g**2*i**2 +
b**3*c**2*d*g**2*i**2) + x*(a**3*d**3*g**2*i**2 - a**2*b*c*d**2*g**2*i**2 -
 a*b**2*c**2*d*g**2*i**2 + b**3*c**3*g**2*i**2))
```

Giac [A]
time = 56.12, size = 111, normalized size = 0.43

$$\frac{\left(Be^2\log\left(\frac{bxe+ae}{dx+c}\right)+Ae^2+Be^2\right)(dx+c)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)^2}{(bxe+ae)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] (B*e^2*log((b*x*e + a*e)/(d*x + c)) + A*e^2 + B*e^2)*(d*x + c)*(b*c/((b*c*e
 - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))^2/((b*x*e + a*e
)*g^2)
```

Mupad [B]
time = 6.18, size = 415, normalized size = 1.59

$$\frac{B\,b\,d\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2}{g^2\,i^2\,(a\,d-b\,c)^3}-\frac{A\,a\,d}{g^2\,i^2\,(a\,d-b\,c)^2\,(a+b\,x)\,(c+d\,x)}-\frac{A\,b\,c}{g^2\,i^2\,(a\,d-b\,c)^2\,(a+b\,x)\,(c+d\,x)}+\frac{B\,a\,d}{g^2\,i^2\,(a\,d-b\,c)^2\,(a+b\,x)\,(c+d\,x)}-\frac{B\,b\,c}{g^2\,i^2\,(a\,d-b\,c)^2\,(a+b\,x)\,(c+d\,x)}-\frac{2\,A\,b\,d\,x}{g^2\,i^2\,(a\,d-b\,c)^2\,(a+b\,x)\,(c+d\,x)}-\frac{B\,a\,d\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^2\,i^2\,(a\,d-b\,c)^2\,(a+b\,x)\,(c+d\,x)}-\frac{B\,b\,c\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^2\,i^2\,(a\,d-b\,c)^2\,(a+b\,x)\,(c+d\,x)}-\frac{2\,B\,b\,d\,x\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{g^2\,i^2\,(a\,d-b\,c)^2\,(a+b\,x)\,(c+d\,x)}-\frac{A\,b\,d\,\mathrm{atan}\left(\frac{a\,d\,1\mathrm{i}+b\,c\,1\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}\right)\,4\mathrm{i}}{g^2\,i^2\,(a\,d-b\,c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/((a*g + b*g*x)^2*(c*i + d*i*x)^2),
x)
```

```
[Out] (B*b*d*log((e*(a + b*x))/(c + d*x))^2)/(g^2*i^2*(a*d - b*c)^3) - (A*b*d*ata
n((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*4i)/(g^2*i^2*(a*d - b*c)^3) - (
A*a*d)/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) - (A*b*c)/(g^2*i^2*(a*d
- b*c)^2*(a + b*x)*(c + d*x)) + (B*a*d)/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c
 + d*x)) - (B*b*c)/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) - (2*A*b*d*x
)/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) - (B*a*d*log((e*(a + b*x))/(c
 + d*x)))/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) - (B*b*c*log((e*(a +
b*x))/(c + d*x)))/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) - (2*B*b*d*x*
log((e*(a + b*x))/(c + d*x)))/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x))
```

3.45 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)^2}\,dx$

Optimal. Leaf size=364

$$\frac{Bd^3(a+bx)}{(bc-ad)^4g^3i^2(c+dx)}+\frac{3b^2Bd(c+dx)}{(bc-ad)^4g^3i^2(a+bx)}-\frac{b^3B(c+dx)^2}{4(bc-ad)^4g^3i^2(a+bx)^2}-\frac{3bBd^2\log^2\left(\frac{a+bx}{c+dx}\right)}{2(bc-ad)^4g^3i^2}-\frac{d^3(a+bx)}{(bc-}$$

```
[Out] B*d^3*(b*x+a)/(-a*d+b*c)^4/g^3/i^2/(d*x+c)+3*b^2*B*d*(d*x+c)/(-a*d+b*c)^4/g
^3/i^2/(b*x+a)-1/4*b^3*B*(d*x+c)^2/(-a*d+b*c)^4/g^3/i^2/(b*x+a)^2-3/2*b*B*d
^2*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^4/g^3/i^2-d^3*(b*x+a)*(A+B*ln(e*(b*x+a)
/(d*x+c)))/(-a*d+b*c)^4/g^3/i^2/(d*x+c)+3*b^2*d*(d*x+c)*(A+B*ln(e*(b*x+a)/(
d*x+c)))/(-a*d+b*c)^4/g^3/i^2/(b*x+a)-1/2*b^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(
d*x+c)))/(-a*d+b*c)^4/g^3/i^2/(b*x+a)^2+3*b*d^2*ln((b*x+a)/(d*x+c))*(A+B*ln
(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^3/i^2
```

Rubi [A]

time = 0.19, antiderivative size = 364, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2562, 45, 2372, 12, 14, 2338}

$$-\frac{b^3(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2d(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^2(a+bx)(bc-ad)^4}-\frac{d^3(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^2(c+dx)(bc-ad)^4}+\frac{3bd^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^2(bc-ad)^4}-\frac{b^3B(c+dx)^2}{4g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2Bd(c+dx)}{g^3i^2(a+bx)(bc-ad)^4}+\frac{Bd^3(a+bx)}{g^3i^2(c+dx)(bc-ad)^4}-\frac{3bBd^2\log^2\left(\frac{a+bx}{c+dx}\right)}{2g^3i^2(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*x)^2),
x]
```

```
[Out] (B*d^3*(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*B*d*(c + d*x))
/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B*(c + d*x)^2)/(4*(b*c - a*d)^4*g
^3*i^2*(a + b*x)^2) - (3*b*B*d^2*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)
^4*g^3*i^2) - (d^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c -
a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*(c + d*x)^2*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2) + (3*b*d^2*
Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)
^4*g^3*i^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(45c+45dx)^2(ag+bgx)^3}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^2g^3(a+bx)^3} - \frac{2b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(a+bx)^2} + \frac{b^2d^2\left(A\right.}{675(b\right.$$

$$= \frac{(b^2d^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{675(bc-ad)^4g^3} - \frac{(bd^3)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{675(bc-ad)^4g^3} - \frac{(2b^2d)\int \frac{A+B\,\mathrm{lo}}{(}}{2025(bc-}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4050(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\right.}{2025(bc-}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4050(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\right.}{2025(bc-}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4050(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\right.}{2025(bc-}$$

$$= -\frac{bB}{8100(bc-ad)^2g^3(a+bx)^2} + \frac{bBd}{810(bc-ad)^3g^3(a+bx)} - \frac{B}{2025(bc-ad}$$

$$= -\frac{bB}{8100(bc-ad)^2g^3(a+bx)^2} + \frac{bBd}{810(bc-ad)^3g^3(a+bx)} - \frac{B}{2025(bc-ad}$$

$$= -\frac{bB}{8100(bc-ad)^2g^3(a+bx)^2} + \frac{bBd}{810(bc-ad)^3g^3(a+bx)} - \frac{B}{2025(bc-ad}$$

$$= -\frac{bB}{8100(bc-ad)^2g^3(a+bx)^2} + \frac{bBd}{810(bc-ad)^3g^3(a+bx)} - \frac{B}{2025(bc-ad}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.47, size = 453, normalized size = 1.24

$$\frac{-\frac{bB(bc-ad)^2}{(a+bx)^2}+\frac{8b^2Bcd}{a+bx}-\frac{8abBd^2}{a+bx}+\frac{2bBd(bc-ad)}{a+bx}-\frac{4bBcd^2}{c+dx}+\frac{4aBd^3}{c+dx}+6bBd^2\log(a+bx)-\frac{2b(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)^2}+\frac{8bd(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx}+\frac{4d^2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}+12bd^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-6bBd^2\log(c+dx)-12bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)-6bBd^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+6bBd^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^4g^3i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*
x)^2),x]
```

```
[Out] (-((b*B*(b*c - a*d)^2)/(a + b*x)^2) + (8*b^2*B*c*d)/(a + b*x) - (8*a*b*B*d^
2)/(a + b*x) + (2*b*B*d*(b*c - a*d))/(a + b*x) - (4*b*B*c*d^2)/(c + d*x) +
(4*a*B*d^3)/(c + d*x) + 6*b*B*d^2*Log[a + b*x] - (2*b*(b*c - a*d)^2*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^2 + (8*b*d*(b*c - a*d)*(A + B*Log[
```

```
(e*(a + b*x))/(c + d*x)]))/(a + b*x) + (4*d^2*(b*c - a*d)*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]))/(c + d*x) + 12*b*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b
*x))/(c + d*x)]) - 6*b*B*d^2*Log[c + d*x] - 12*b*d^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x] - 6*b*B*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log
[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
+ 6*b*B*d^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d
*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^4*g^3*i^2)
```

Maple [A]
time = 0.74, size = 628, normalized size = 1.73 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/2*d^2*e/i^2/(a*d-b*c)^5/g^3*A*b^3/(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2-3*d^3/i^2/(a*d-b*c)^5/g^3*A*b^2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
3*d^4/e/i^2/(a*d-b*c)^5/g^3*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d^5/e^2/i^2
/(a*d-b*c)^5/g^3*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-d^2*e/i^2/(a*d-b*c)^5/g^3*
B*b^3*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)+3*d^3/i^2/(a*d-b*c)^5/g^3*B*b^2*(-1/(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/(b*e/d+(a*d-
b*c)*e/d/(d*x+c)))-3/2*d^4/e/i^2/(a*d-b*c)^5/g^3*B*b*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))^2+d^5/e^2/i^2/(a*d-b*c)^5/g^3*B*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1621 vs. $2(338) = 676$.
time = 0.49, size = 1621, normalized size = 4.45

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] -1/2*B*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a
*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g
^3*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a
^4*b*d^4)*g^3*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^
4*b*c*d^3 - a^5*d^4)*g^3*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d
^2 - a^5*c*d^3)*g^3) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a
^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3) - 6*b*d^2*log(d*x + c)/((b^4
*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3))*l
og(b*x*e/(d*x + c) + a*e/(d*x + c)) - 1/2*A*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a
*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d
```

```
^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^
2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*x^2 + (2*a*b^4*c^4 - 5*a
^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*x + (a^2*b^3*
c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3) + 6*b*d^2*log(b*x
 + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d
^4)*g^3) - 6*b*d^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d
^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3)) + 1/4*(b^3*c^3 - 12*a*b^2*c^2*d + 15*a^
2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3 + a^
2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*
log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x
^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(3*b^3*c^2*d - 2*a*b
^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b
^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(b^3*d^3*x^3
+ a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)
*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^
2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*B/(a^2*b^4*c^5*g^3 - 4*
a^3*b^3*c^4*d*g^3 + 6*a^4*b^2*c^3*d^2*g^3 - 4*a^5*b*c^2*d^3*g^3 + a^6*c*d^4
*g^3 + (b^6*c^4*d*g^3 - 4*a*b^5*c^3*d^2*g^3 + 6*a^2*b^4*c^2*d^3*g^3 - 4*a^3
*b^3*c*d^4*g^3 + a^4*b^2*d^5*g^3)*x^3 + (b^6*c^5*g^3 - 2*a*b^5*c^4*d*g^3 -
2*a^2*b^4*c^3*d^2*g^3 + 8*a^3*b^3*c^2*d^3*g^3 - 7*a^4*b^2*c*d^4*g^3 + 2*a^5
*b*d^5*g^3)*x^2 + (2*a*b^5*c^5*g^3 - 7*a^2*b^4*c^4*d*g^3 + 8*a^3*b^3*c^3*d^
2*g^3 - 2*a^4*b^2*c^2*d^3*g^3 - 2*a^5*b*c*d^4*g^3 + a^6*d^5*g^3)*x)
```

Fricas [A]
time = 0.43, size = 650, normalized size = 1.79

$$\frac{(2A+B)b^3c^3 - 12(A+B)ab^2c^2d + 3(2A+5B)a^2bcd^2 + 4(A-B)a^3d^3 - 6((2A+B)b^3cd^2 - (2A+B)ab^2d^3)x^2 - 6(Bb^3d^3x^3 + Ba^2bcd^2 + (Bb^3cd^2 + 2Bab^2d^3)x^2 + (2Bab^2cd^2 + Ba^2bd^3)x)\log\left(\frac{(bx+a)e}{dx+c}\right)^2 - 3((2A+3B)b^3c^2d + 2(2A-B)ab^2cd^2 - (6A+B)a^2bd^3)x - 2(3(2A+B)b^3d^3x^3 - Bb^3c^3 + 6Bab^2c^2d + 6Aa^2bcd^2 - 2Ba^3d^3 + 3((2A+3B)b^3cd^2 + 4Aab^2d^3)x^2 + 3(Bb^3c^2d + 4(A+B)ab^2cd^2 + 2(A-B)a^2bd^3)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4((b^6c^4d - 4ab^5c^3d^2 + 6a^2b^4c^2d^3 - 4a^3b^3cd^4 + a^4b^2d^5)g^3x^3 + (b^6c^5 - 2ab^5c^4d - 2a^2b^4c^3d^2 + 8a^3b^3c^2d^3 - 7a^4b^2cd^4 + 2a^5bd^5)g^3x^2 + (2ab^5c^5 - 7a^2b^4c^4d + 8a^3b^3c^3d^2 - 2a^4b^2c^2d^3 - 2a^5bcd^4 + a^6d^5)g^3x + (a^2b^4c^5 - 4a^3b^3c^4d + 6a^4b^2c^3d^2 - 4a^5bc^2d^3 + a^6cd^4)g^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] 1/4*((2*A + B)*b^3*c^3 - 12*(A + B)*a*b^2*c^2*d + 3*(2*A + 5*B)*a^2*b*c*d^2
 + 4*(A - B)*a^3*d^3 - 6*((2*A + B)*b^3*c*d^2 - (2*A + B)*a*b^2*d^3)*x^2 -
6*(B*b^3*d^3*x^3 + B*a^2*b*c*d^2 + (B*b^3*c*d^2 + 2*B*a*b^2*d^3)*x^2 + (2*B
*a*b^2*c*d^2 + B*a^2*b*d^3)*x)*log((b*x + a)*e/(d*x + c))^2 - 3*((2*A + 3*B
)*b^3*c^2*d + 2*(2*A - B)*a*b^2*c*d^2 - (6*A + B)*a^2*b*d^3)*x - 2*(3*(2*A
+ B)*b^3*d^3*x^3 - B*b^3*c^3 + 6*B*a*b^2*c^2*d + 6*A*a^2*b*c*d^2 - 2*B*a^3*
d^3 + 3*((2*A + 3*B)*b^3*c*d^2 + 4*A*a*b^2*d^3)*x^2 + 3*(B*b^3*c^2*d + 4*(A
 + B)*a*b^2*c*d^2 + 2*(A - B)*a^2*b*d^3)*x)*log((b*x + a)*e/(d*x + c)))/((b
^6*c^4*d - 4*a*b^5*c^3*d^2 + 6*a^2*b^4*c^2*d^3 - 4*a^3*b^3*c*d^4 + a^4*b^2*
d^5)*g^3*x^3 + (b^6*c^5 - 2*a*b^5*c^4*d - 2*a^2*b^4*c^3*d^2 + 8*a^3*b^3*c^2
*d^3 - 7*a^4*b^2*c*d^4 + 2*a^5*b*d^5)*g^3*x^2 + (2*a*b^5*c^5 - 7*a^2*b^4*c^
4*d + 8*a^3*b^3*c^3*d^2 - 2*a^4*b^2*c^2*d^3 - 2*a^5*b*c*d^4 + a^6*d^5)*g^3*
x + (a^2*b^4*c^5 - 4*a^3*b^3*c^4*d + 6*a^4*b^2*c^3*d^2 - 4*a^5*b*c^2*d^3 +
a^6*c*d^4)*g^3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 57.82, size = 239, normalized size = 0.66

$$\frac{\left(2\,Bbe^{3}\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{4\,(bxe+ae)Bde^{2}\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+2\,Abe^{3}+Bbe^{3}-\frac{4\,(bxe+ae)Ade^{2}}{dx+c}-\frac{4\,(bxe+ae)Bde^{2}}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)^{2}}{4\left(\frac{(bxe+ae)^{2}bcg^{3}}{(dx+c)^{2}}-\frac{(bxe+ae)^{2}adg^{3}}{(dx+c)^{2}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] 1/4*(2*B*b*e^3*log((b*x*e + a*e)/(d*x + c)) - 4*(b*x*e + a*e)*B*d*e^2*log((
b*x*e + a*e)/(d*x + c))/(d*x + c) + 2*A*b*e^3 + B*b*e^3 - 4*(b*x*e + a*e)*A
*d*e^2/(d*x + c) - 4*(b*x*e + a*e)*B*d*e^2/(d*x + c))*(b*c/((b*c*e - a*d*e)
*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))^2/((b*x*e + a*e)^2*b*c*g
^3/(d*x + c)^2 - (b*x*e + a*e)^2*a*d*g^3/(d*x + c)^2)
```

Mupad [**B**]
time = 9.11, size = 984, normalized size = 2.70

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/((a*g + b*g*x)^3*(c*i + d*i*x)^2),
x)
```

```
[Out] (3*B*b*d^2*log((e*(a + b*x))/(c + d*x))^2)/(2*g^3*i^2*(a*d - b*c)^4) - (A*b
*d^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*6i)/(g^3*i^2*(a*d - b*c
)^4) - (B*b*d^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*3i)/(g^3*i^2
*(a*d - b*c)^4) - (A*a^2*d^2)/(g^3*i^2*(a*d - b*c)^3*(a + b*x)^2*(c + d*x))
 + (A*b^2*c^2)/(2*g^3*i^2*(a*d - b*c)^3*(a + b*x)^2*(c + d*x)) + (B*a^2*d^2
)/(g^3*i^2*(a*d - b*c)^3*(a + b*x)^2*(c + d*x)) + (B*b^2*c^2)/(4*g^3*i^2*(a
*d - b*c)^3*(a + b*x)^2*(c + d*x)) - (B*a*d*log((e*(a + b*x))/(c + d*x)))/(
g^3*i^2*(a*d - b*c)^2*(a + b*x)^2*(c + d*x)) - (B*b*c*log((e*(a + b*x))/(c
+ d*x)))/(2*g^3*i^2*(a*d - b*c)^2*(a + b*x)^2*(c + d*x)) - (3*A*b^2*d^2*x^2
)/(g^3*i^2*(a*d - b*c)^3*(a + b*x)^2*(c + d*x)) - (3*B*b^2*d^2*x^2)/(2*g^3*
```

```
i^2*(a*d - b*c)^3*(a + b*x)^2*(c + d*x)) - (5*A*a*b*c*d)/(2*g^3*i^2*(a*d -
b*c)^3*(a + b*x)^2*(c + d*x)) - (11*B*a*b*c*d)/(4*g^3*i^2*(a*d - b*c)^3*(a
+ b*x)^2*(c + d*x)) - (3*B*b*d*x*log((e*(a + b*x))/(c + d*x)))/(2*g^3*i^2*(
a*d - b*c)^2*(a + b*x)^2*(c + d*x)) - (3*B*b^2*d^2*x^2*log((e*(a + b*x))/(c
 + d*x)))/(g^3*i^2*(a*d - b*c)^3*(a + b*x)^2*(c + d*x)) - (9*A*a*b*d^2*x)/(
2*g^3*i^2*(a*d - b*c)^3*(a + b*x)^2*(c + d*x)) - (3*B*a*b*d^2*x)/(4*g^3*i^2
*(a*d - b*c)^3*(a + b*x)^2*(c + d*x)) - (3*A*b^2*c*d*x)/(2*g^3*i^2*(a*d - b
*c)^3*(a + b*x)^2*(c + d*x)) - (9*B*b^2*c*d*x)/(4*g^3*i^2*(a*d - b*c)^3*(a
+ b*x)^2*(c + d*x)) - (3*B*a*b*c*d*log((e*(a + b*x))/(c + d*x)))/(g^3*i^2*(
a*d - b*c)^3*(a + b*x)^2*(c + d*x)) - (3*B*a*b*d^2*x*log((e*(a + b*x))/(c +
 d*x)))/(g^3*i^2*(a*d - b*c)^3*(a + b*x)^2*(c + d*x)) - (3*B*b^2*c*d*x*log(
(e*(a + b*x))/(c + d*x)))/(g^3*i^2*(a*d - b*c)^3*(a + b*x)^2*(c + d*x))
```

3.46 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)^2}\,dx$

Optimal. Leaf size=457

$$-\frac{Bd^4(a+bx)}{(bc-ad)^5g^4i^2(c+dx)}-\frac{6b^2Bd^2(c+dx)}{(bc-ad)^5g^4i^2(a+bx)}+\frac{b^3Bd(c+dx)^2}{(bc-ad)^5g^4i^2(a+bx)^2}-\frac{b^4B(c+dx)^3}{9(bc-ad)^5g^4i^2(a+bx)^3}+\frac{2bB\ldots}{(bc\ldots}$$

```
[Out] -B*d^4*(b*x+a)/(-a*d+b*c)^5/g^4/i^2/(d*x+c)-6*b^2*B*d^2*(d*x+c)/(-a*d+b*c)^
5/g^4/i^2/(b*x+a)+b^3*B*d*(d*x+c)^2/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^2-1/9*b^4*
B*(d*x+c)^3/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^3+2*b*B*d^3*ln((b*x+a)/(d*x+c))^2/
(-a*d+b*c)^5/g^4/i^2+d^4*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^5/g
^4/i^2/(d*x+c)-6*b^2*d^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^5/g
^4/i^2/(b*x+a)+2*b^3*d*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^5/g
^4/i^2/(b*x+a)^2-1/3*b^4*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^5
/g^4/i^2/(b*x+a)^3-4*b*d^3*ln((b*x+a)/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/
(-a*d+b*c)^5/g^4/i^2
```

Rubi [A]

time = 0.21, antiderivative size = 457, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 45, 2372, 2338}

$$-\frac{b^4(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^4i^2(a+bx)^3(bc-ad)^5}+\frac{2b^3d(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)^2(bc-ad)^5}-\frac{6b^2d^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5}+\frac{d^4(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(c+dx)(bc-ad)^5}-\frac{4bd^3\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(bc-ad)^5}-\frac{b^4B(c+dx)^3}{9g^4i^2(a+bx)^3(bc-ad)^5}+\frac{b^3Bd(c+dx)^2}{g^4i^2(a+bx)^2(bc-ad)^5}-\frac{6b^2Bd^2(c+dx)}{g^4i^2(a+bx)(bc-ad)^5}-\frac{Bd^4(a+bx)}{g^4i^2(c+dx)(bc-ad)^5}+\frac{2bBd^3\log^2\left(\frac{a+bx}{c+dx}\right)}{g^4i^2(bc-ad)^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*x)^2),
x]
```

```
[Out] -((B*d^4*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x))) - (6*b^2*B*d^2*(c +
d*x))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (b^3*B*d*(c + d*x)^2)/((b*c - a*d
)^5*g^4*i^2*(a + b*x)^2) - (b^4*B*(c + d*x)^3)/(9*(b*c - a*d)^5*g^4*i^2*(a
+ b*x)^3) + (2*b*B*d^3*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^5*g^4*i^2)
+ (d^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^4*i
^2*(c + d*x)) - (6*b^2*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*d*(c + d*x)^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2) - (b^4*(c + d*x)^3*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3)
 - (4*b*d^3*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
((b*c - a*d)^5*g^4*i^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(46c+46dx)^2(ag+bgx)^4}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^2g^4(a+bx)^4} - \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1058(bc-ad)^3g^4(a+bx)^3} + \frac{3b^2d^2\left(A\right.}{2116(bc}\right.$$

$$= -\frac{(b^2d^3)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{529(bc-ad)^5g^4} + \frac{(bd^4)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{529(bc-ad)^5g^4} + \frac{(3b^2d^2)\int\frac{A+B}{}}{2116(bc}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6348(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^3g^4(a+bx)^2} - \frac{3bd^2\left(A+B\right.}{2116(bc-}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6348(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^3g^4(a+bx)^2} - \frac{3bd^2\left(A+B\right.}{2116(bc-}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6348(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^3g^4(a+bx)^2} - \frac{3bd^2\left(A+B\right.}{2116(bc-}$$

$$= -\frac{bB}{19044(bc-ad)^2g^4(a+bx)^3} + \frac{bBd}{3174(bc-ad)^3g^4(a+bx)^2} - \frac{13}{6348(bc-}$$

$$= -\frac{bB}{19044(bc-ad)^2g^4(a+bx)^3} + \frac{bBd}{3174(bc-ad)^3g^4(a+bx)^2} - \frac{13}{6348(bc-}$$

$$= -\frac{bB}{19044(bc-ad)^2g^4(a+bx)^3} + \frac{bBd}{3174(bc-ad)^3g^4(a+bx)^2} - \frac{13}{6348(bc-}$$

$$= -\frac{bB}{19044(bc-ad)^2g^4(a+bx)^3} + \frac{bBd}{3174(bc-ad)^3g^4(a+bx)^2} - \frac{13}{6348(bc-}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.84, size = 520, normalized size = 1.14

$$-\frac{\frac{bB(bc-ad)^3}{(a+bx)^3} - \frac{6bBd(bc-ad)^2}{(a+bx)^2} + \frac{27b^2Bcd^2}{a+bx} - \frac{27abBd^3}{a+bx} + \frac{12bBd^2(bc-ad)}{a+bx} - \frac{9bBcd^3}{c+dx} + \frac{9aBd^4}{c+dx} + 30bBd^3\log(a+bx) + \frac{3b(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)^3} - \frac{9bd(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)^2} + \frac{27bd^2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx} - \frac{9d^3(-bc+ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx} + 36bd^3\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) - 30bBd^3\log(c+dx) - 36bd^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx) - 18bBd^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right) + 18bBd^3\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx) + 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{9(bc-ad)^5g^4i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*
x)^2),x]
```

```
[Out] -1/9*((b*B*(b*c - a*d)^3)/(a + b*x)^3 - (6*b*B*d*(b*c - a*d)^2)/(a + b*x)^2
 + (27*b^2*B*c*d^2)/(a + b*x) - (27*a*b*B*d^3)/(a + b*x) + (12*b*B*d^2*(b*c
 - a*d))/(a + b*x) - (9*b*B*c*d^3)/(c + d*x) + (9*a*B*d^4)/(c + d*x) + 30*b
*B*d^3*Log[a + b*x] + (3*b*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)
```

```
]))/(a + b*x)^3 - (9*b*d*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(a + b*x)^2 + (27*b*d^2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(a + b*x) - (9*d^3*(-(b*c) + a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c
 + d*x) + 36*b*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 30*b
*B*d^3*Log[c + d*x] - 36*b*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c +
 d*x] - 18*b*B*d^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*b*B*d^3*((2*Log[
(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^5*g^4*i^2)
```

Maple [A]
time = 0.91, size = 803, normalized size = 1.76 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/3*d^2*e^2/i^2/(a*d-b*c)^6/g^4*A*b^4/(b*e/d+(a*d-b*c)
*e/d/(d*x+c))^3+2*d^3*e/i^2/(a*d-b*c)^6/g^4*A*b^3/(b*e/d+(a*d-b*c)*e/d/(d*x
+c))^2-6*d^4/i^2/(a*d-b*c)^6/g^4*A*b^2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))-4*d^5/
e/i^2/(a*d-b*c)^6/g^4*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d^6/e^2/i^2/(a*d-
b*c)^6/g^4*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d^2*e^2/i^2/(a*d-b*c)^6/g^4*B*b^
4*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/9
/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)-4*d^3*e/i^2/(a*d-b*c)^6/g^4*B*b^3*(-1/2/(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4/(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^2)+6*d^4/i^2/(a*d-b*c)^6/g^4*B*b^2*(-1/(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/(b*e/d+(a*d-b*c)*e/d/(d*x
+c)))-2*d^5/e/i^2/(a*d-b*c)^6/g^4*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+d^6
/e^2/i^2/(a*d-b*c)^6/g^4*B*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 2424 vs. 2(429) = 858.
time = 0.57, size = 2424, normalized size = 5.30

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] 1/3*B*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d
^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^
2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c
*d^4 + a^4*b^3*d^5)*g^4*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 +
14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*x^3 + 3*(a*b^6*c
```

```
^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*
d^4 + a^6*b*d^5)*g^4*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c
^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*x + (a^3*b^4*c^5 -
4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4) + 1
2*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^
3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4) - 12*b*d^3*log(d*x + c)/((b^5
*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*
d^4 - a^5*d^5)*g^4))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 1/3*A*((12*b^3*
d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d
^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^2*b*d^3)*x)/((b
^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*
d^5)*g^4*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*
d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*
c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5
)*g^4*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5*
b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d
 + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4) + 12*b*d^3*log(b*x
 + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 +
 5*a^4*b*c*d^4 - a^5*d^5)*g^4) - 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*
c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*
g^4)) + 1/9*(b^4*c^4 - 9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*a^3*b*c*d^3
+ 9*a^4*d^4 + 30*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^2 + 8*a*b^3*
c*d^3 - 19*a^2*b^2*d^4)*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 +
3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a
^3*b*d^4)*x)*log(b*x + a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 +
3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a
^3*b*d^4)*x)*log(d*x + c)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 + 57*a^2*b^2*
c*d^3 + 19*a^3*b*d^4)*x + 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*
b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b
*d^4)*x)*log(b*x + a) - 6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3
*a*b^3*d^4)*x^3 + 15*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 +
 a^3*b*d^4)*x - 6*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^
3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*lo
g(b*x + a))*log(d*x + c))*B/(a^3*b^5*c^6*g^4 - 5*a^4*b^4*c^5*d*g^4 + 10*a^5
*b^3*c^4*d^2*g^4 - 10*a^6*b^2*c^3*d^3*g^4 + 5*a^7*b*c^2*d^4*g^4 - a^8*c*d^5
*g^4 + (b^8*c^5*d*g^4 - 5*a*b^7*c^4*d^2*g^4 + 10*a^2*b^6*c^3*d^3*g^4 - 10*a
^3*b^5*c^2*d^4*g^4 + 5*a^4*b^4*c*d^5*g^4 - a^5*b^3*d^6*g^4)*x^4 + (b^8*c^6*
g^4 - 2*a*b^7*c^5*d*g^4 - 5*a^2*b^6*c^4*d^2*g^4 + 20*a^3*b^5*c^3*d^3*g^4 -
25*a^4*b^4*c^2*d^4*g^4 + 14*a^5*b^3*c*d^5*g^4 - 3*a^6*b^2*d^6*g^4)*x^3 + 3*
(a*b^7*c^6*g^4 - 4*a^2*b^6*c^5*d*g^4 + 5*a^3*b^5*c^4*d^2*g^4 - 5*a^5*b^3*c^
2*d^4*g^4 + 4*a^6*b^2*c*d^5*g^4 - a^7*b*d^6*g^4)*x^2 + (3*a^2*b^6*c^6*g^4 -
 14*a^3*b^5*c^5*d*g^4 + 25*a^4*b^4*c^4*d^2*g^4 - 20*a^5*b^3*c^3*d^3*g^4 + 5
*a^6*b^2*c^2*d^4*g^4 + 2*a^7*b*c*d^5*g^4 - a^8*d^6*g^4)*x)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1002 vs.

2(429) = 858.
time = 0.43, size = 1002, normalized size = 2.19

$$\frac{(3\,A+B)b^4c^4-9\,(2\,A+B)ab^3c^3d+54\,(A+B)a^2b^2c^2d^2-5\,(6\,A+11\,B)a^3bcd^3-9\,(A-B)a^4d^4+6\,((6\,A+5\,B)b^4cd^3-(6\,A+5\,B)ab^3d^4)x^3+3\,((6\,A+11\,B)b^4c^2d^2+8\,(3\,A+B)ab^3cd^3-(30\,A+19\,B)a^2b^2d^4)x^2+18\,(Bb^4d^4x^4+Ba^3bcd^3+(Bb^4cd^3+3\,Bab^3d^4)x^3+3\,(Bab^3cd^3+Ba^2b^2d^4)x^2+(3\,Ba^2b^2cd^3+Ba^3bd^4)x)\log\left(\frac{(bx+a)e}{dx+c}\right)^2-((6\,A+5\,B)b^4c^3d-27\,(2\,A+3\,B)ab^3c^2d^2-3\,(6\,A-19\,B)a^2b^2cd^3+(66\,A+19\,B)a^3bd^4)x+3\,(2\,(6\,A+5\,B)b^4d^4x^4+Bb^4c^4-6\,Bab^3c^3d+18\,Ba^2b^2c^2d^2+12\,Aa^3bcd^3-3\,Ba^4d^4+2\,((6\,A+11\,B)b^4cd^3+9\,(2\,A+B)ab^3d^4)x^3+6\,(Bb^4c^2d^2+3\,(2\,A+3\,B)ab^3cd^3+6\,Aa^2b^2d^4)x^2-2\,(Bb^4c^3d-9\,Bab^3c^2d^2-18\,(A+B)a^2b^2cd^3-6\,(A-B)a^3bd^4)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{9\,((b^8c^5d-5\,ab^7c^4d^2+10\,a^2b^6c^3d^3-10\,a^3b^5c^2d^4+5\,a^4b^4cd^5-a^5b^3d^6)g^4x^4+(b^8c^6-2\,ab^7c^5d-5\,a^2b^6c^4d^2+20\,a^3b^5c^3d^3-25\,a^4b^4c^2d^4+14\,a^5b^3cd^5-3\,a^6b^2d^6)g^4x^3+3\,(ab^7c^6-4\,a^2b^6c^5d+5\,a^3b^5c^4d^2-5\,a^5b^3c^2d^4+4\,a^6b^2cd^5-a^7bd^6)g^4x^2+(3\,a^2b^6c^6-14\,a^3b^5c^5d+25\,a^4b^4c^4d^2-20\,a^5b^3c^3d^3+5\,a^6b^2c^2d^4+2\,a^7bcd^5-a^8d^6)g^4x+(a^3b^5c^6-5\,a^4b^4c^5d+10\,a^5b^3c^4d^2-10\,a^6b^2c^3d^3+5\,a^7bc^2d^4-a^8cd^5)g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] 1/9*((3*A + B)*b^4*c^4 - 9*(2*A + B)*a*b^3*c^3*d + 54*(A + B)*a^2*b^2*c^2*d
^2 - 5*(6*A + 11*B)*a^3*b*c*d^3 - 9*(A - B)*a^4*d^4 + 6*((6*A + 5*B)*b^4*c*
d^3 - (6*A + 5*B)*a*b^3*d^4)*x^3 + 3*((6*A + 11*B)*b^4*c^2*d^2 + 8*(3*A + B
)*a*b^3*c*d^3 - (30*A + 19*B)*a^2*b^2*d^4)*x^2 + 18*(B*b^4*d^4*x^4 + B*a^3*
b*c*d^3 + (B*b^4*c*d^3 + 3*B*a*b^3*d^4)*x^3 + 3*(B*a*b^3*c*d^3 + B*a^2*b^2*
d^4)*x^2 + (3*B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*x)*log((b*x + a)*e/(d*x + c))^
2 - ((6*A + 5*B)*b^4*c^3*d - 27*(2*A + 3*B)*a*b^3*c^2*d^2 - 3*(6*A - 19*B)*
a^2*b^2*c*d^3 + (66*A + 19*B)*a^3*b*d^4)*x + 3*(2*(6*A + 5*B)*b^4*d^4*x^4 +
 B*b^4*c^4 - 6*B*a*b^3*c^3*d + 18*B*a^2*b^2*c^2*d^2 + 12*A*a^3*b*c*d^3 - 3*
B*a^4*d^4 + 2*((6*A + 11*B)*b^4*c*d^3 + 9*(2*A + B)*a*b^3*d^4)*x^3 + 6*(B*b
^4*c^2*d^2 + 3*(2*A + 3*B)*a*b^3*c*d^3 + 6*A*a^2*b^2*d^4)*x^2 - 2*(B*b^4*c^
3*d - 9*B*a*b^3*c^2*d^2 - 18*(A + B)*a^2*b^2*c*d^3 - 6*(A - B)*a^3*b*d^4)*x
)*log((b*x + a)*e/(d*x + c)))/((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b^6*c^
3*d^3 - 10*a^3*b^5*c^2*d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*x^4 + (b^8*
c^6 - 2*a*b^7*c^5*d - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*a^4*b^4*c
^2*d^4 + 14*a^5*b^3*c*d^5 - 3*a^6*b^2*d^6)*g^4*x^3 + 3*(a*b^7*c^6 - 4*a^2*b
^6*c^5*d + 5*a^3*b^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c*d^5 - a^7*b*
d^6)*g^4*x^2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*b^4*c^4*d^2 - 20*
a^5*b^3*c^3*d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*d^6)*g^4*x + (a^3
*b^5*c^6 - 5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a^6*b^2*c^3*d^3 + 5*a^
7*b*c^2*d^4 - a^8*c*d^5)*g^4)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 74.76, size = 384, normalized size = 0.84

$$\frac{\left(6\,Bb^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{18\,(bxe+ae)Bbde^3\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{18\,(bxe+ae)^2Bd^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+6\,Ab^2e^4+2\,Bb^2e^4-\frac{18\,(bxe+ae)Abde^3}{dx+c}-\frac{9\,(bxe+ae)Bbde^3}{dx+c}+\frac{18\,(bxe+ae)^2Ad^2e^2}{(dx+c)^2}+\frac{18\,(bxe+ae)^2Bd^2e^2}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)^2}{18\left(\frac{(bxe+ae)^3b^2c^2g^4}{(dx+c)^3}-\frac{2\,(bxe+ae)^3abcdg^4}{(dx+c)^3}+\frac{(bxe+ae)^3a^2d^2g^4}{(dx+c)^3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] 1/18*(6*B*b^2*e^4*log((b*x*e + a*e)/(d*x + c)) - 18*(b*x*e + a*e)*B*b*d*e^3
*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 18*(b*x*e + a*e)^2*B*d^2*e^2*log(
(b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 6*A*b^2*e^4 + 2*B*b^2*e^4 - 18*(b*x*
e + a*e)*A*b*d*e^3/(d*x + c) - 9*(b*x*e + a*e)*B*b*d*e^3/(d*x + c) + 18*(b*
x*e + a*e)^2*A*d^2*e^2/(d*x + c)^2 + 18*(b*x*e + a*e)^2*B*d^2*e^2/(d*x + c)
^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))
^2/((b*x*e + a*e)^3*b^2*c^2*g^4/(d*x + c)^3 - 2*(b*x*e + a*e)^3*a*b*c*d*g^4
/(d*x + c)^3 + (b*x*e + a*e)^3*a^2*d^2*g^4/(d*x + c)^3)
```

Mupad [B]
time = 12.44, size = 1679, normalized size = 3.67

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/((a*g + b*g*x)^4*(c*i + d*i*x)^2),
x)
```

```
[Out] (2*B*b*d^3*log((e*(a + b*x))/(c + d*x))^2)/(g^4*i^2*(a*d - b*c)^2*(a^3*d^3
- b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (log((e*(a + b*x))/(c + d*x))
*(x*((4*B)/(3*g^4*i^2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (4*B*b*d^3*(((2*a^
2*d^2 + b^2*c^2 - 3*a*b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2))*(a*d +
b*c) + (a*c*(a*d - b*c))/d^2))/(g^4*i^2*(a*d - b*c)^2*(a^3*d^3 - b^3*c^3 +
3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) + (B*(3*a*d + b*c))/(3*g^4*i^2*(a^2*b*d^3
+ b^3*c^2*d - 2*a*b^2*c*d^2)) + (4*B*b^2*d^2*x^3)/(g^4*i^2*(a*d - b*c)*(a^3
*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (4*B*b*d^3*x^2*(b*d*((2*
a^2*d^2 + b^2*c^2 - 3*a*b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)) + ((a
*d + b*c)*(a*d - b*c))/d^2))/(g^4*i^2*(a*d - b*c)^2*(a^3*d^3 - b^3*c^3 + 3*
a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (4*B*a*b*c*d^3*((2*a^2*d^2 + b^2*c^2 - 3*a*
b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)))/(g^4*i^2*(a*d - b*c)^2*(a^3*
d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))))/(b^2*x^4 + (a^3*c)/(b*d)
+ (x*(a^3*d + 3*a^2*b*c))/(b*d) + (x^3*(b^3*c + 3*a*b^2*d))/(b*d) + (x^2*(3
*a*b^2*c + 3*a^2*b*d))/(b*d)) - (b*d^3*atan((b*d^3*((a^5*d^5*g^4*i^2 + b^5*
c^5*g^4*i^2 - 3*a*b^4*c^4*d*g^4*i^2 - 3*a^4*b*c*d^4*g^4*i^2 + 2*a^2*b^3*c^3
*d^2*g^4*i^2 + 2*a^3*b^2*c^2*d^3*g^4*i^2)/(a^4*d^4*g^4*i^2 + b^4*c^4*g^4*i^
2 - 4*a*b^3*c^3*d*g^4*i^2 - 4*a^3*b*c*d^3*g^4*i^2 + 6*a^2*b^2*c^2*d^2*g^4*i
^2) + 2*b*d*x)*(6*A + 5*B)*(a^4*d^4*g^4*i^2 + b^4*c^4*g^4*i^2 - 4*a*b^3*c^3
*d*g^4*i^2 - 4*a^3*b*c*d^3*g^4*i^2 + 6*a^2*b^2*c^2*d^2*g^4*i^2)*2i)/(g^4*i^
2*(a*d - b*c)^5*(12*A*b*d^3 + 10*B*b*d^3)))*(6*A + 5*B)*4i)/(3*g^4*i^2*(a*d
 - b*c)^5) - ((9*A*a^3*d^3 + 3*A*b^3*c^3 - 9*B*a^3*d^3 + B*b^3*c^3 - 15*A*a
*b^2*c^2*d + 39*A*a^2*b*c*d^2 - 8*B*a*b^2*c^2*d + 46*B*a^2*b*c*d^2)/(3*(a*d
```

```
 - b*c)) + (x*(66*A*a^2*b*d^3 + 19*B*a^2*b*d^3 - 6*A*b^3*c^2*d - 5*B*b^3*c^
2*d + 48*A*a*b^2*c*d^2 + 76*B*a*b^2*c*d^2))/(3*(a*d - b*c)) + (x^2*(30*A*a*
b^2*d^3 + 19*B*a*b^2*d^3 + 6*A*b^3*c*d^2 + 11*B*b^3*c*d^2))/(a*d - b*c) + (
2*x^3*(6*A*b^3*d^3 + 5*B*b^3*d^3))/(a*d - b*c))/(x*(3*a^6*d^4*g^4*i^2 - 9*a
^2*b^4*c^4*g^4*i^2 + 24*a^3*b^3*c^3*d*g^4*i^2 - 18*a^4*b^2*c^2*d^2*g^4*i^2)
 - x^2*(9*a*b^5*c^4*g^4*i^2 - 9*a^5*b*d^4*g^4*i^2 - 18*a^2*b^4*c^3*d*g^4*i^
2 + 18*a^4*b^2*c*d^3*g^4*i^2) - x^3*(3*b^6*c^4*g^4*i^2 - 9*a^4*b^2*d^4*g^4*
i^2 + 24*a^3*b^3*c*d^3*g^4*i^2 - 18*a^2*b^4*c^2*d^2*g^4*i^2) + x^4*(3*a^3*b
^3*d^4*g^4*i^2 - 3*b^6*c^3*d*g^4*i^2 + 9*a*b^5*c^2*d^2*g^4*i^2 - 9*a^2*b^4*
c*d^3*g^4*i^2) - 3*a^3*b^3*c^4*g^4*i^2 + 3*a^6*c*d^3*g^4*i^2 + 9*a^4*b^2*c^
3*d*g^4*i^2 - 9*a^5*b*c^2*d^2*g^4*i^2)
```

3.47 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=361

$$-\frac{3B(bc-ad)g^3(a+bx)^2}{4d^2i^3(c+dx)^2}-\frac{3bB(bc-ad)g^3(a+bx)}{d^3i^3(c+dx)}+\frac{b(3A+B)(bc-ad)g^3(a+bx)}{d^3i^3(c+dx)}+\frac{3bB(bc-ad)g^3(a+b}{d^3i^3(c+d}$$

```
[Out] -3/4*B*(-a*d+b*c)*g^3*(b*x+a)^2/d^2/i^3/(d*x+c)^2-3*b*B*(-a*d+b*c)*g^3*(b*x
+a)/d^3/i^3/(d*x+c)+b*(3*A+B)*(-a*d+b*c)*g^3*(b*x+a)/d^3/i^3/(d*x+c)+3*b*B*
(-a*d+b*c)*g^3*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/d^3/i^3/(d*x+c)+g^3*(b*x+a)^3*
(A+B*ln(e*(b*x+a)/(d*x+c)))/d/i^3/(d*x+c)^2+1/2*(-a*d+b*c)*g^3*(b*x+a)^2*(3
*A+B+3*B*ln(e*(b*x+a)/(d*x+c)))/d^2/i^3/(d*x+c)^2+b^2*(-a*d+b*c)*g^3*ln((-a
*d+b*c)/b/(d*x+c))*(3*A+B+3*B*ln(e*(b*x+a)/(d*x+c)))/d^4/i^3+3*b^2*B*(-a*d+
b*c)*g^3*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i^3
```

Rubi [A]
time = 0.25, antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2562, 2384, 45, 2393, 2332, 2341, 2354, 2438}

$$\frac{3b^2Bg^3(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3}+\frac{b^2g^3(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right)+3A+B\right)}{d^4i^3}+\frac{bg^3(3A+B)(a+bx)(bc-ad)}{d^3i^3(c+dx)}+\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right)+3A+B\right)}{2d^2i^3(c+dx)^2}+\frac{g^3(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{di^3(c+dx)^2}+\frac{3bBg^3(a+bx)(bc-ad)\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^3i^3(c+dx)}-\frac{3bBg^3(a+bx)(bc-ad)}{d^3i^3(c+dx)}-\frac{3Bg^3(a+bx)^2(bc-ad)}{4d^2i^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^3,
x]
```

```
[Out] (-3*B*(b*c - a*d)*g^3*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (3*b*B*(b*c -
a*d)*g^3*(a + b*x))/(d^3*i^3*(c + d*x)) + (b*(3*A + B)*(b*c - a*d)*g^3*(a +
 b*x))/(d^3*i^3*(c + d*x)) + (3*b*B*(b*c - a*d)*g^3*(a + b*x)*Log[(e*(a + b
*x))/(c + d*x)])/(d^3*i^3*(c + d*x)) + (g^3*(a + b*x)^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(d*i^3*(c + d*x)^2) + ((b*c - a*d)*g^3*(a + b*x)^2*(3*A
+ B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^3*(c + d*x)^2) + (b^2*(b*
c - a*d)*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(3*A + B + 3*B*Log[(e*(a + b*x)
)/(c + d*x)]))/(d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*PolyLog[2, (d*(a + b*x)
)/(b*(c + d*x))])/(d^4*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(47c+47dx)^3}\,dx = \int\left(\frac{b^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{103823d^3}+\frac{(-bc+ad)^3g^3\left(A+B\log\left(\frac{e(\cdots}{\cdots}\right.\right.}{103823d^3(c+dx)^3}\cdots\right.$$

$$=\frac{(b^3g^3)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{103823d^3}-\frac{(3b^2(bc-ad)g^3)\int\frac{A+B\log(\cdots}{c+\cdots}}{103823d^3}\cdots$$

$$=\frac{Ab^3g^3x}{103823d^3}+\frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{207646d^4(c+dx)^2}-\frac{3b(bc-ad)^2g\cdots}{103\cdots}$$

$$=\frac{Ab^3g^3x}{103823d^3}+\frac{b^2Bg^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{103823d^3}+\frac{(bc-ad)^3g^3\left(A+B\cdots\right.}{207646d^4(c\cdots}$$

$$=\frac{Ab^3g^3x}{103823d^3}+\frac{b^2Bg^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{103823d^3}+\frac{(bc-ad)^3g^3\left(A+B\cdots\right.}{207646d^4(c\cdots}$$

$$=\frac{Ab^3g^3x}{103823d^3}-\frac{B(bc-ad)^3g^3}{415292d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3}{207646d^4(c+dx)}+\frac{5b^2B(bc\cdots}{\cdots}$$

$$=\frac{Ab^3g^3x}{103823d^3}-\frac{B(bc-ad)^3g^3}{415292d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3}{207646d^4(c+dx)}+\frac{5b^2B(bc\cdots}{\cdots}$$

$$=\frac{Ab^3g^3x}{103823d^3}-\frac{B(bc-ad)^3g^3}{415292d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3}{207646d^4(c+dx)}+\frac{5b^2B(bc\cdots}{\cdots}$$

$$=\frac{Ab^3g^3x}{103823d^3}-\frac{B(bc-ad)^3g^3}{415292d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3}{207646d^4(c+dx)}+\frac{5b^2B(bc\cdots}{\cdots}$$

Mathematica [A]
time = 0.30, size = 317, normalized size = 0.88

$$\frac{g^3\left(4Ab^3dx-\frac{B(bc-ad)^3}{(c+dx)^2}+\frac{10bB(bc-ad)^2}{c+dx}+10b^2B(bc-ad)\log(a+bx)+4b^2Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+\frac{2(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(c+dx)^2}-\frac{12b(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}-14b^2B(bc-ad)\log(c+dx)-12b^2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)+6b^2B(bc-ad)\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{4d^4i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i
*x)^3,x]

[Out] (g^3*(4*A*b^3*d*x - (B*(b*c - a*d)^3)/(c + d*x)^2 + (10*b*B*(b*c - a*d)^2)/
(c + d*x) + 10*b^2*B*(b*c - a*d)*Log[a + b*x] + 4*b^2*B*d*(a + b*x)*Log[(e*
(a + b*x))/(c + d*x)] + (2*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)
```

```
]))/(c + d*x)^2 - (12*b*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(c + d*x) - 14*b^2*B*(b*c - a*d)*Log[c + d*x] - 12*b^2*(b*c - a*d)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 6*b^2*B*(b*c - a*d)*((2*Log[(d
*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])))/(4*d^4*i^3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 736 vs. $2(357) = 714$.

time = 1.46, size = 737, normalized size = 2.04

method	result
derivativedivides	$-\frac{e(ad-cb)\left(\frac{2g^3Ab\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{d\,e^2i^3}+\frac{g^3A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2e^3i^3}+\frac{g^3Ab^3}{d^2i^3\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}+\frac{3g^3Ab^2\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right.\right.}{d^2e\,i^3}\right.}{}$
default	$-\frac{e(ad-cb)\left(\frac{2g^3Ab\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{d\,e^2i^3}+\frac{g^3A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2e^3i^3}+\frac{g^3Ab^3}{d^2i^3\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}+\frac{3g^3Ab^2\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right.\right.}{d^2e\,i^3}\right.}{}$
risch	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(2*g^3/d/e^2/i^3*A*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/2*g
^3/e^3/i^3*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+g^3/d^2/i^3*A*b^3/(b*e-(b*e/d+
(a*d-b*c)*e/d/(d*x+c))*d)+3*g^3/d^2/e/i^3*A*b^2*ln(b*e-(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*d)+1/2*g^3/e^3/i^3*B*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))-1/4*g^3/e^3/i^3*B*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+2*g^3
/d/e^2/i^3*B*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)-2*g^3/d/e^2/i^3*B*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+g^3/d^2/e/i^3*B*b^2*ln(
b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)+g^3/d/e/i^3*B*b^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*d)+3*g^3/d^2/e/i^3*B*b^2*dilog(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)/b/
e)+3*g^3/d^2/e/i^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(-b*e+(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*d)/b/e))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1797 vs. $2(339) = 678$.

time = 0.47, size = 1797, normalized size = 4.98

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] -(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(
d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c -
 a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*
c^2*d^2 - I*a*c*d^3)*x) - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^3*x^2
 + 4*I*c*d^2*x + 2*I*c^2*d))*B*a^3*g^3 - 3*B*a^2*b*g^3*((b^2*c - 2*a*b*d)*l
og(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c - 2*a*
b*d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (2*d*x
+ c)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*
c^2*d^2) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*
a*c^2*d^3 - 4*(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) +
 A*b^3*g^3*((6*c^2*d*x + 5*c^3)/(2*I*d^6*x^2 + 4*I*c*d^5*x + 2*I*c^2*d^4) +
 I*x/d^3 - 3*I*c*log(d*x + c)/d^4) - 3*A*a*b^2*g^3*((4*c*d*x + 3*c^2)/(2*I*
d^5*x^2 + 4*I*c*d^4*x + 2*I*c^2*d^3) - I*log(d*x + c)/d^3) + 3*(2*d*x + c)*
A*a^2*b*g^3/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + A*a^3*g^3/(2*I*d^3*
x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + 1/2*(-13*I*b^5*c^3*g^3 + 37*I*a*b^4*c^2*d*
g^3 - 32*I*a^2*b^3*c*d^2*g^3 + 6*I*a^3*b^2*d^3*g^3)*B*log(d*x + c)/(b^2*c^2
*d^4 - 2*a*b*c*d^5 + a^2*d^6) + 1/4*(4*(I*b^5*c^2*d^3*g^3 - 2*I*a*b^4*c*d^4
*g^3 + I*a^2*b^3*d^5*g^3)*B*x^3 + 8*(I*b^5*c^3*d^2*g^3 - 2*I*a*b^4*c^2*d^3*
g^3 + I*a^2*b^3*c*d^4*g^3)*B*x^2 + 2*(I*b^5*c^4*d*g^3 - I*a^2*b^3*c^2*d^3*g
^3)*B*x + 6*((I*b^5*c^3*d^2*g^3 - 3*I*a*b^4*c^2*d^3*g^3 + 3*I*a^2*b^3*c*d^4
*g^3 - I*a^3*b^2*d^5*g^3)*B*x^2 + 2*(I*b^5*c^4*d*g^3 - 3*I*a*b^4*c^3*d^2*g^
3 + 3*I*a^2*b^3*c^2*d^3*g^3 - I*a^3*b^2*c*d^4*g^3)*B*x + (I*b^5*c^5*g^3 - 3
*I*a*b^4*c^4*d*g^3 + 3*I*a^2*b^3*c^3*d^2*g^3 - I*a^3*b^2*c^2*d^3*g^3)*B)*lo
g(d*x + c)^2 - (I*b^5*c^5*g^3 - 3*I*a*b^4*c^4*d*g^3 - I*a^2*b^3*c^3*d^2*g^3
 + 3*I*a^3*b^2*c^2*d^3*g^3)*B + 2*(2*(I*b^5*c^2*d^3*g^3 - 2*I*a*b^4*c*d^4*g
^3 + I*a^2*b^3*d^5*g^3)*B*x^3 + (9*I*b^5*c^3*d^2*g^3 - 21*I*a*b^4*c^2*d^3*g
^3 + 12*I*a^2*b^3*c*d^4*g^3 + 2*I*a^3*b^2*d^5*g^3)*B*x^2 + 2*(3*I*b^5*c^4*d
*g^3 - 3*I*a*b^4*c^3*d^2*g^3 - 6*I*a^2*b^3*c^2*d^3*g^3 + 8*I*a^3*b^2*c*d^4*
g^3)*B*x + (6*I*a*b^4*c^4*d*g^3 - 15*I*a^2*b^3*c^3*d^2*g^3 + 11*I*a^3*b^2*c
^2*d^3*g^3)*B)*log(b*x + a) + 2*(2*(-I*b^5*c^2*d^3*g^3 + 2*I*a*b^4*c*d^4*g^
3 - I*a^2*b^3*d^5*g^3)*B*x^3 + 4*(-I*b^5*c^3*d^2*g^3 + 2*I*a*b^4*c^2*d^3*g^
3 - I*a^2*b^3*c*d^4*g^3)*B*x^2 + 4*(I*b^5*c^4*d*g^3 - 5*I*a*b^4*c^3*d^2*g^3
 + 7*I*a^2*b^3*c^2*d^3*g^3 - 3*I*a^3*b^2*c*d^4*g^3)*B*x + (5*I*b^5*c^5*g^3
- 19*I*a*b^4*c^4*d*g^3 + 23*I*a^2*b^3*c^3*d^2*g^3 - 9*I*a^3*b^2*c^2*d^3*g^3
)*B)*log(d*x + c))/(b^2*c^4*d^4 - 2*a*b*c^3*d^5 + a^2*c^2*d^6 + (b^2*c^2*d^
6 - 2*a*b*c*d^7 + a^2*d^8)*x^2 + 2*(b^2*c^3*d^5 - 2*a*b*c^2*d^6 + a^2*c*d^7
)*x) - 3*(I*b^3*c*g^3 - I*a*b^2*d*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c
 - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/d^4
```

Fricas [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] integral((I*A*b^3*g^3*x^3 + 3*I*A*a*b^2*g^3*x^2 + 3*I*A*a^2*b*g^3*x + I*A*a
^3*g^3 + (I*B*b^3*g^3*x^3 + 3*I*B*a*b^2*g^3*x^2 + 3*I*B*a^2*b*g^3*x + I*B*a
^3*g^3)*log((b*x + a)*e/(d*x + c)))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^
3), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(I*d*x + I*c)^
3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}{(c\,i+d\,i\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x))))/(c*i + d*i*x)^3,
x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x))))/(c*i + d*i*x)^3,
 x)
```

3.48 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=251

$$\frac{Bg^2(a+bx)^2}{4di^3(c+dx)^2}-\frac{Abg^2(a+bx)}{d^2i^3(c+dx)}+\frac{bBg^2(a+bx)}{d^2i^3(c+dx)}-\frac{bBg^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^2i^3(c+dx)}-\frac{g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{2di^3(c+dx)^2}$$

```
[Out] 1/4*B*g^2*(b*x+a)^2/d/i^3/(d*x+c)^2-A*b*g^2*(b*x+a)/d^2/i^3/(d*x+c)+b*B*g^2
*(b*x+a)/d^2/i^3/(d*x+c)-b*B*g^2*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/d^2/i^3/(d*x
+c)-1/2*g^2*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/d/i^3/(d*x+c)^2-b^2*g^2*l
n((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3/i^3-b^2*B*g^2*polyl
og(2,d*(b*x+a)/b/(d*x+c))/d^3/i^3
```

Rubi [A]
time = 0.16, antiderivative size = 251, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$, Rules used = {2562, 45, 2393, 2332, 2341, 2354, 2438}

$$-\frac{b^2Bg^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^3}-\frac{b^2g^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^3}-\frac{g^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2di^3(c+dx)^2}-\frac{Abg^2(a+bx)}{d^2i^3(c+dx)}-\frac{bBg^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^2i^3(c+dx)}+\frac{bBg^2(a+bx)}{d^2i^3(c+dx)}+\frac{Bg^2(a+bx)^2}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^3,
x]
```

```
[Out] (B*g^2*(a + b*x)^2)/(4*d*i^3*(c + d*x)^2) - (A*b*g^2*(a + b*x))/(d^2*i^3*(c
 + d*x)) + (b*B*g^2*(a + b*x))/(d^2*i^3*(c + d*x)) - (b*B*g^2*(a + b*x)*Log
[(e*(a + b*x))/(c + d*x)])/(d^2*i^3*(c + d*x)) - (g^2*(a + b*x)^2*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(2*d*i^3*(c + d*x)^2) - (b^2*g^2*Log[(b*c - a*
d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^3) - (b^2*B*
g^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(48c+48dx)^3}\,dx = \int\left(\frac{(-bc+ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{110592d^2(c+dx)^3} - \frac{b(bc-ad)g^2\left(A+\right.}{55296d^2(c\right.}$$

$$= \frac{(b^2g^2)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{110592d^2} - \frac{(b(bc-ad)g^2)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}\,dx}{55296d^2}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{221184d^3(c+dx)^2} + \frac{b(bc-ad)g^2\left(A+B\log\right.}{55296d^3(c+d}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{221184d^3(c+dx)^2} + \frac{b(bc-ad)g^2\left(A+B\log\right.}{55296d^3(c+d}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{221184d^3(c+dx)^2} + \frac{b(bc-ad)g^2\left(A+B\log\right.}{55296d^3(c+d}$$

$$= \frac{B(bc-ad)^2g^2}{442368d^3(c+dx)^2} - \frac{bB(bc-ad)g^2}{73728d^3(c+dx)} - \frac{b^2Bg^2\log(a+bx)}{73728d^3} - \frac{(b}{}$$

$$= \frac{B(bc-ad)^2g^2}{442368d^3(c+dx)^2} - \frac{bB(bc-ad)g^2}{73728d^3(c+dx)} - \frac{b^2Bg^2\log(a+bx)}{73728d^3} - \frac{(b}{}$$

$$= \frac{B(bc-ad)^2g^2}{442368d^3(c+dx)^2} - \frac{bB(bc-ad)g^2}{73728d^3(c+dx)} - \frac{b^2Bg^2\log(a+bx)}{73728d^3} - \frac{(b}{}$$

$$= \frac{B(bc-ad)^2g^2}{442368d^3(c+dx)^2} - \frac{bB(bc-ad)g^2}{73728d^3(c+dx)} - \frac{b^2Bg^2\log(a+bx)}{73728d^3} - \frac{(b}{}$$

Mathematica [A]
time = 0.22, size = 245, normalized size = 0.98

$$\frac{g^2\left(\frac{B(bc-ad)^2}{(c+dx)^2} - \frac{6bB(bc-ad)}{c+dx} - 6b^2B\log(a+bx) - \frac{2(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(c+dx)^2} + \frac{8b(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx} + 6b^2B\log(c+dx) + 4b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx) - 2b^2B\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right) - \log(c+dx)\right)\log(c+dx) + 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{4d^3i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i
*x)^3,x]
```

```
[Out] (g^2*((B*(b*c - a*d)^2)/(c + d*x)^2 - (6*b*B*(b*c - a*d))/(c + d*x) - 6*b^2
*B*Log[a + b*x] - (2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c
 + d*x)^2 + (8*b*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x
) + 6*b^2*B*Log[c + d*x] + 4*b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
```

+ d*x] - 2*b^2*B*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log [c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*d^3*i^3)

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 605 vs. $2(247) = 494$.
time = 1.43, size = 606, normalized size = 2.41

method	result
derivativedivides	$-\frac{e(ad-cb)\left(\frac{g^2 Ab\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)e^2 i^3}+\frac{g^2 dA\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2(ad-cb)e^3 i^3}+\frac{g^2 A b^2 \ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{d(ad-cb)e\, i^3}+\frac{g^2 dB\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2 \ln}{2(ad-cb)e^3}\right.}{}$
default	$-\frac{e(ad-cb)\left(\frac{g^2 Ab\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)e^2 i^3}+\frac{g^2 dA\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2(ad-cb)e^3 i^3}+\frac{g^2 A b^2 \ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{d(ad-cb)e\, i^3}+\frac{g^2 dB\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2 \ln}{2(ad-cb)e^3}\right.}{}$
risch	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(g^2/(a*d-b*c)/e^2/i^3*A*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))
+1/2*g^2*d/(a*d-b*c)/e^3/i^3*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+g^2/d/(a*d-b
*c)/e/i^3*A*b^2*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)+1/2*g^2*d/(a*d-b*c)
/e^3/i^3*B*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
1/4*g^2*d/(a*d-b*c)/e^3/i^3*B*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+g^2/(a*d-b*c)
/e^2/i^3*B*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
g^2/(a*d-b*c)/e^2/i^3*B*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+g^2/d/(a*d-b*c)/e/i
^3*B*b^2*dilog(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)/b/e)+g^2/d/(a*d-b*c)
/e/i^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(-b*e+(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*d)/b/e))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] -(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(
d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c -
```

```
 a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*
c^2*d^2 - I*a*c*d^3)*x) - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^3*x^2
 + 4*I*c*d^2*x + 2*I*c^2*d))*B*a^2*g^2 - 2*B*a*b*g^2*((b^2*c - 2*a*b*d)*log
(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c - 2*a*b*
d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (2*d*x +
c)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^
2*d^2) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a*
c^2*d^3 - 4*(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) - A
*b^2*g^2*((4*c*d*x + 3*c^2)/(2*I*d^5*x^2 + 4*I*c*d^4*x + 2*I*c^2*d^3) - I*l
og(d*x + c)/d^3) - 1/2*B*b^2*g^2*(((I*d^2*x^2 + 2*I*c*d*x + I*c^2)*log(d*x
+ c)^2 + (4*I*c*d*x + 3*I*c^2)*log(d*x + c))/(d^5*x^2 + 2*c*d^4*x + c^2*d^3
) - 2*integrate(1/2*(2*I*d^2*x^2*log(b*x + a) + 2*I*d^2*x^2 + 4*I*c*d*x + 3
*I*c^2)/(d^5*x^3 + 3*c*d^4*x^2 + 3*c^2*d^3*x + c^3*d^2), x)) + 2*(2*d*x + c
)*A*a*b*g^2/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + A*a^2*g^2/(2*I*d^3*
x^2 + 4*I*c*d^2*x + 2*I*c^2*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] integral((I*A*b^2*g^2*x^2 + 2*I*A*a*b*g^2*x + I*A*a^2*g^2 + (I*B*b^2*g^2*x^
2 + 2*I*B*a*b*g^2*x + I*B*a^2*g^2)*log((b*x + a)*e/(d*x + c)))/(d^3*x^3 + 3
*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)/(I*d*x + I*c)^
3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2\,\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}{{\left(c\,i+d\,i\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x))))/(c*i + d*i*x)^3,
x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x))))/(c*i + d*i*x)^3,
 x)
```

3.49 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=85

$$-\frac{Bg(a+bx)^2}{4(bc-ad)i^3(c+dx)^2}+\frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2(bc-ad)i^3(c+dx)^2}$$

```
[Out] -1/4*B*g*(b*x+a)^2/(-a*d+b*c)/i^3/(d*x+c)^2+1/2*g*(b*x+a)^2*(A+B*ln(e*(b*x+
a)/(d*x+c)))/(-a*d+b*c)/i^3/(d*x+c)^2
```

Rubi [A]
time = 0.04, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$, Rules used = {2562, 2341}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2i^3(c+dx)^2(bc-ad)}-\frac{Bg(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^3,x]
```

```
[Out] -1/4*(B*g*(a + b*x)^2)/((b*c - a*d)*i^3*(c + d*x)^2) + (g*(a + b*x)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)*i^3*(c + d*x)^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(49c+49dx)^3}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{117649d(c+dx)^3} + \frac{bg\left(A+B\log\left(\frac{e(a+b}{c+da}\right.\right.}{117649d(c+dx)}\right.$$

$$= \frac{(bg)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}dx}{117649d} - \frac{((bc-ad)g)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^3}dx}{117649d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{235298d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{117649d^2(c+dx)} +$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{235298d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{117649d^2(c+dx)} +$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{235298d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{117649d^2(c+dx)} +$$

$$= -\frac{B(bc-ad)g}{470596d^2(c+dx)^2} + \frac{bBg}{235298d^2(c+dx)} + \frac{b^2Bg\log(a+bx)}{235298d^2(bc-ad)}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 207 vs. 2(85) = 170.
time = 0.11, size = 207, normalized size = 2.44

$$\frac{g\left(\frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2d^2(c+dx)^2} - \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2(c+dx)} + \frac{bB\left(\frac{1}{c+dx}+\frac{b\log(a+bx)}{bc-ad}-\frac{b\log(c+dx)}{bc-ad}\right)}{d^2} - \frac{B\left(\frac{bc-ad}{(c+dx)^2}+\frac{2b}{c+dx}+\frac{2b^2\log(a+bx)}{bc-ad}-\frac{2b^2\log(c+dx)}{bc-ad}\right)}{4d^2}\right)}{i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x
)^3,x]
```

```
[Out] (g*(((b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*(c + d*x)^2)
- (b*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*(c + d*x)) + (b*B*((c + d*x
)^(-1) + (b*Log[a + b*x])/(b*c - a*d) - (b*Log[c + d*x])/(b*c - a*d)))/d^2
- (B*((b*c - a*d)/(c + d*x)^2 + (2*b)/(c + d*x) + (2*b^2*Log[a + b*x])/(b*c
 - a*d) - (2*b^2*Log[c + d*x])/(b*c - a*d)))/(4*d^2)))/i^3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 180 vs. 2(81) = 162.
time = 0.51, size = 181, normalized size = 2.13

method	result

norman	$\frac{-\frac{2Aadg+2Abcg-Badg-Bbcg}{4i\,d^2}-\frac{(2Abg-Bbg)x}{2id}-\frac{B\,a^2g\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2i(ad-cb)}-\frac{B\,b^2g\,x^2\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2(ad-cb)i}-\frac{Babgx\ln\left(\frac{e(bx+a)}{dx+c}\right)}{i(ad-cb)}}{i^2(dx+c)^2}$
derivativedivides	$-\frac{e(ad-cb)\left(\frac{g\,d^2A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2(ad-cb)^2e^3i^3}+\frac{g\,d^2B\left(\frac{\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{2}-\frac{\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{4}\right)}{(ad-cb)^2e^3i^3}\right)}{d^2}$
default	$-\frac{e(ad-cb)\left(\frac{g\,d^2A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2(ad-cb)^2e^3i^3}+\frac{g\,d^2B\left(\frac{\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{2}-\frac{\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{4}\right)}{(ad-cb)^2e^3i^3}\right)}{d^2}$
risch	$-\frac{Bg(2bdx+ad+cb)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2d^2i^3(dx+c)^2}-\frac{g(2B\ln(bx+a)b^2d^2x^2-2B\ln(-dx-c)b^2d^2x^2+4B\ln(bx+a)b^2cdx-4B\ln(-dx-c)b}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x,method=_RETURNV
ERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/2*g*d^2/(a*d-b*c)^2/e^3/i^3*A*(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^2+g*d^2/(a*d-b*c)^2/e^3/i^3*B*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 522 vs. $2(76) = 152$.
time = 0.29, size = 522, normalized size = 6.14

$$-\left(\frac{b^2\log(bx+a)}{2i\,b^2c^2d-4i\,abcd^2+2i\,a^2d^3}-\frac{b^2\log(dx+c)}{2i\,b^2c^2d-4i\,abcd^2+2i\,a^2d^3}-\frac{2\,bdx+3\,bc-ad}{-4i\,bc^3d+4i\,ac^2d^2-4\,(i\,bcd^3-i\,ad^4)x^2-8\,(i\,bc^2d^2-i\,acd^3)x}-\frac{\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)}{2i\,d^3x^2+4i\,cd^2x+2i\,c^2d}\right)Bag-Bbg\left(\frac{(b^2c-2\,abd)\log(bx+a)}{2i\,b^2c^2d^2-4i\,abcd^3+2i\,a^2d^4}-\frac{(b^2c-2\,abd)\log(dx+c)}{2i\,b^2c^2d^2-4i\,abcd^3+2i\,a^2d^4}-\frac{(2\,dx+c)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)}{2i\,d^4x^2+4i\,cd^3x+2i\,c^2d^2}-\frac{bc^2-3\,acd+2\,(bcd-2\,ad^2)x}{-4i\,bc^3d^2+4i\,ac^2d^3-4\,(i\,bcd^4-i\,ad^5)x^2-8\,(i\,bc^2d^3-i\,acd^4)x}\right)+\frac{(2\,dx+c)Abg}{2i\,d^4x^2+4i\,cd^3x+2i\,c^2d^2}+\frac{Aag}{2i\,d^3x^2+4i\,cd^2x+2i\,c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorit
hm="maxima")
```

```
[Out] -(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(
d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c -
 a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*
c^2*d^2 - I*a*c*d^3)*x) - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^3*x^2
 + 4*I*c*d^2*x + 2*I*c^2*d))*B*a*g - B*b*g*((b^2*c - 2*a*b*d)*log(b*x + a)/
(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c - 2*a*b*d)*log(d*x
 + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (2*d*x + c)*log(b*x
*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) - (
b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a*c^2*d^3 -
```

```
4*(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) + (2*d*x + c)
*A*b*g/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + A*a*g/(2*I*d^3*x^2 + 4*I
*c*d^2*x + 2*I*c^2*d)
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 174 vs. $2(76) = 152$.
time = 0.39, size = 174, normalized size = 2.05

$$\frac{2\left((-2i\,A+i\,B)b^2cd+(2i\,A-i\,B)abd^2\right)gx-\left((2i\,A-i\,B)b^2c^2+(-2i\,A+i\,B)a^2d^2\right)g+2\left(i\,Bb^2d^2gx^2+2i\,Babd^2gx+i\,Ba^2d^2g\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4\left(bc^3d^2-ac^2d^3+(bcd^4-ad^5)x^2+2\,(bc^2d^3-acd^4)x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorit
hm="fricas")
```

```
[Out] 1/4*(2*((-2*I*A + I*B)*b^2*c*d + (2*I*A - I*B)*a*b*d^2)*g*x - ((2*I*A - I*B
)*b^2*c^2 + (-2*I*A + I*B)*a^2*d^2)*g + 2*(I*B*b^2*d^2*g*x^2 + 2*I*B*a*b*d^
2*g*x + I*B*a^2*d^2*g)*log((b*x + a)*e/(d*x + c)))/(b*c^3*d^2 - a*c^2*d^3 +
 (b*c*d^4 - a*d^5)*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*x)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 382 vs. $2(71) = 142$.
time = 3.23, size = 382, normalized size = 4.49

$$\frac{Bb^2g\log\left(x+\frac{-\frac{Ba^2b^2d^2g}{ad-bc}+\frac{2Bab^3cdg}{ad-bc}+Bab^2dg-\frac{Bb^4c^2g}{ad-bc}+Bb^3cg}{2Bb^3dg}\right)}{2d^2i^3\,(ad-bc)}-\frac{Bb^2g\log\left(x+\frac{\frac{Ba^2b^2d^2g}{ad-bc}-\frac{2Bab^3cdg}{ad-bc}+Bab^2dg+\frac{Bb^4c^2g}{ad-bc}+Bb^3cg}{2Bb^3dg}\right)}{2d^2i^3\,(ad-bc)}+\frac{-2Aadg-2Abcg+Badg+Bbcg+x(-4Abdg+2Bbdg)}{4c^2d^2i^3+8cd^3i^3x+4d^4i^3x^2}+\frac{(-Badg-Bbcg-2Bbdgx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2c^2d^2i^3+4cd^3i^3x+2d^4i^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**3,x)
```

```
[Out] B*b**2*g*log(x + (-B*a**2*b**2*d**2*g/(a*d - b*c) + 2*B*a*b**3*c*d*g/(a*d -
 b*c) + B*a*b**2*d*g - B*b**4*c**2*g/(a*d - b*c) + B*b**3*c*g)/(2*B*b**3*d*
g))/(2*d**2*i**3*(a*d - b*c)) - B*b**2*g*log(x + (B*a**2*b**2*d**2*g/(a*d -
 b*c) - 2*B*a*b**3*c*d*g/(a*d - b*c) + B*a*b**2*d*g + B*b**4*c**2*g/(a*d -
b*c) + B*b**3*c*g)/(2*B*b**3*d*g))/(2*d**2*i**3*(a*d - b*c)) + (-2*A*a*d*g
- 2*A*b*c*g + B*a*d*g + B*b*c*g + x*(-4*A*b*d*g + 2*B*b*d*g))/(4*c**2*d**2*
i**3 + 8*c*d**3*i**3*x + 4*d**4*i**3*x**2) + (-B*a*d*g - B*b*c*g - 2*B*b*d*
g*x)*log(e*(a + b*x)/(c + d*x))/(2*c**2*d**2*i**3 + 4*c*d**3*i**3*x + 2*d**
4*i**3*x**2)
```

Giac [**A**]
time = 2.55, size = 149, normalized size = 1.75

$$\frac{1}{4}\left(\frac{2i\,(bxe+ae)^2Bg\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+\frac{2i\,(bxe+ae)^2Ag}{(dx+c)^2}-\frac{i\,(bxe+ae)^2Bg}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)e^{(-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorit
hm="giac")
```

```
[Out] 1/4*(2*I*(b*x*e + a*e)^2*B*g*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 2*I
*(b*x*e + a*e)^2*A*g/(d*x + c)^2 - I*(b*x*e + a*e)^2*B*g/(d*x + c)^2)*(b*c/
((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))*e^(-1)
```

Mupad [B]
time = 5.63, size = 198, normalized size = 2.33

$$-\frac{x\,\left(2\,A\,b\,d\,g-B\,b\,d\,g\right)+A\,a\,d\,g+A\,b\,c\,g-\frac{B\,a\,d\,g}{2}-\frac{B\,b\,c\,g}{2}}{2\,c^2\,d^2\,i^3+4\,c\,d^3\,i^3\,x+2\,d^4\,i^3\,x^2}-\frac{\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(\frac{B\,a\,g}{2\,d^2\,i^3}+\frac{B\,b\,c\,g}{2\,d^3\,i^3}+\frac{B\,b\,g\,x}{d^2\,i^3}\right)}{2\,c\,x+d\,x^2+\frac{c^2}{d}}+\frac{B\,b^2\,g\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,1\mathrm{i}}{d^2\,i^3\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x))))/(c*i + d*i*x)^3,x)
```

```
[Out] (B*b^2*g*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*1i)/(d^2*i^3*(a*d - b*c
)) - (log((e*(a + b*x))/(c + d*x))*((B*a*g)/(2*d^2*i^3) + (B*b*c*g)/(2*d^3*
i^3) + (B*b*g*x)/(d^2*i^3)))/(2*c*x + d*x^2 + c^2/d) - (x*(2*A*b*d*g - B*b*
d*g) + A*a*d*g + A*b*c*g - (B*a*d*g)/2 - (B*b*c*g)/2)/(2*c^2*d^2*i^3 + 2*d^
4*i^3*x^2 + 4*c*d^3*i^3*x)
```

3.50 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=144

$$\frac{B}{4di^3(c+dx)^2}+\frac{bB}{2d(bc-ad)i^3(c+dx)}+\frac{b^2B\log(a+bx)}{2d(bc-ad)^2i^3}-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2di^3(c+dx)^2}-\frac{b^2B\log(c+dx)}{2d(bc-ad)^2i^3}$$

```
[Out] 1/4*B/d/i^3/(d*x+c)^2+1/2*b*B/d/(-a*d+b*c)/i^3/(d*x+c)+1/2*b^2*B*ln(b*x+a)/
d/(-a*d+b*c)^2/i^3+1/2*(-A-B*ln(e*(b*x+a)/(d*x+c)))/d/i^3/(d*x+c)^2-1/2*b^2
*B*ln(d*x+c)/d/(-a*d+b*c)^2/i^3
```

Rubi [A]

time = 0.08, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2548, 21, 46}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2di^3(c+dx)^2}+\frac{b^2B\log(a+bx)}{2di^3(bc-ad)^2}-\frac{b^2B\log(c+dx)}{2di^3(bc-ad)^2}+\frac{bB}{2di^3(c+dx)(bc-ad)}+\frac{B}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x)^3,x]
```

```
[Out] B/(4*d*i^3*(c + d*x)^2) + (b*B)/(2*d*(b*c - a*d)*i^3*(c + d*x)) + (b^2*B*Lo
g[a + b*x])/(2*d*(b*c - a*d)^2*i^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/
(2*d*i^3*(c + d*x)^2) - (b^2*B*Log[c + d*x])/(2*d*(b*c - a*d)^2*i^3)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2548

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*(
```

```
(A + B*Log[e*((a + b*x)^n/(c + d*x)^n)])/(g*(m + 1))), x] - Dist[B*n*((b*c
- a*d)/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /;
 FreeQ[{a, b, c, d, e, f, g, A, B, m, n}, x] && EqQ[n + mn, 0] && NeQ[b*c -
 a*d, 0] && NeQ[m, -1] &&  !(EqQ[m, -2] && IntegerQ[n])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(50c+50dx)^3}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c+dx)^2}+\frac{B\int \frac{bc-ad}{2500(a+bx)(c+dx)^3}\,dx}{100d}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c+dx)^2}+\frac{(B(bc-ad))\int \frac{1}{(a+bx)(c+dx)^3}\,dx}{250000d}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c+dx)^2}+\frac{(B(bc-ad))\int \left(\frac{b^3}{(bc-ad)^3(a+bx)}-\frac{d}{(bc-ad)(c+dx)^3}-\frac{b}{(bc-ad)^2}\right.}{250000d}$$

$$= \frac{B}{500000d(c+dx)^2}+\frac{bB}{250000d(bc-ad)(c+dx)}+\frac{b^2B\log(a+bx)}{250000d(bc-ad)^2}-\frac{A+B}{25000}$$

Mathematica [A]
time = 0.08, size = 111, normalized size = 0.77

$$\frac{-2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+\frac{B\left((bc-ad)(3bc-ad+2bdx)+2b^2(c+dx)^2\log(a+bx)-2b^2(c+dx)^2\log(c+dx)\right)}{(bc-ad)^2}}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x)^3,x]
```

```
[Out] (-2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*((b*c - a*d)*(3*b*c - a*d + 2
*b*d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]))
/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 336 vs. $2(137) = 274$.
time = 0.48, size = 337, normalized size = 2.34

method	result
norman	$\frac{\frac{B\,b^2cx\ln\left(\frac{e(bx+a)}{dx+c}\right)}{\left(a^2d^2-2abcd+b^2c^2\right)i}-\frac{2Aa\,d^2-2Abcd-Ba\,d^2+3Bbcd}{4i\,d^2(ad-cb)}-\frac{Bbx}{2i(ad-cb)}-\frac{Ba(ad-2cb)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2i\left(a^2d^2-2abcd+b^2c^2\right)}+\frac{b^2Bd\,x^2\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2\left(a^2d^2-2abcd+b^2c^2\right)i}}{i^2(dx+c)^2}$

risch	$-\frac{B\ln\left(\frac{e(bx+a)}{dx+c}\right)}{2d\,i^3(dx+c)^2}-\frac{2B\ln(dx+c)b^2d^2x^2-2B\ln(-bx-a)b^2d^2x^2+4B\ln(dx+c)b^2cdx-4B\ln(-bx-a)b^2cdx+2B\ln(dx\cdots}{4(a^2d^2-2a\cdots}$
derivativedivides	$-\frac{e(ad-cb)\left(-\frac{d^2Ab\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)^3e^2i^3}+\frac{d^3A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2(ad-cb)^3e^3i^3}-\frac{d^2Bb\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)-\frac{(ad-cb)e}{d(dx+c)}-\frac{be}{d}\right)}{(ad-cb)^3e^2i^3}\cdots\right.}{d^2}$
default	$-\frac{e(ad-cb)\left(-\frac{d^2Ab\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)^3e^2i^3}+\frac{d^3A\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2(ad-cb)^3e^3i^3}-\frac{d^2Bb\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)-\frac{(ad-cb)e}{d(dx+c)}-\frac{be}{d}\right)}{(ad-cb)^3e^2i^3}\cdots\right.}{d^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-d^2/(a*d-b*c)^3/e^2/i^3*A*b*(b*e/d+(a*d-b*c)*e/d/(d*x+
c))+1/2*d^3/(a*d-b*c)^3/e^3/i^3*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-d^2/(a*d-
b*c)^3/e^2/i^3*B*b*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d)+d^3/(a*d-b*c)^3/e^3/i^3*B*(1/2*(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*e/d+(a*d-b*c
)*e/d/(d*x+c))^2))
```

Maxima [A]
time = 0.28, size = 233, normalized size = 1.62

$$-\left(\frac{b^2\log\left(bx+a\right)}{2i\,b^2c^2d-4i\,abcd^2+2i\,a^2d^3}-\frac{b^2\log\left(dx+c\right)}{2i\,b^2c^2d-4i\,abcd^2+2i\,a^2d^3}-\frac{2\,bdx+3\,bc-ad}{-4i\,bc^3d+4i\,ac^2d^2-4\,(i\,bcd^3-i\,ad^4)x^2-8\,(i\,bc^2d^2-i\,acd^3)x}-\frac{\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)}{2i\,d^3x^2+4i\,cd^2x+2i\,c^2d}\right)B+\frac{A}{2i\,d^3x^2+4i\,cd^2x+2i\,c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorithm="maxima")
```

```
[Out] -(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(
d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c -
 a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*
c^2*d^2 - I*a*c*d^3)*x) - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^3*x^2
 + 4*I*c*d^2*x + 2*I*c^2*d))*B + A/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d)
```

Fricas [A]
time = 0.37, size = 213, normalized size = 1.48

$$\frac{(-2i\,A+3i\,B)b^2c^2-4\,(-i\,A+i\,B)abcd+(-2i\,A+i\,B)a^2d^2-2\,(-i\,Bb^2cd+i\,Babd^2)x-2\,(-i\,Bb^2d^2x^2-2i\,Bb^2cdx-2i\,Babcd+i\,Ba^2d^2)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4\,(b^2c^4d-2\,abc^3d^2+a^2c^2d^3+(b^2c^2d^3-2\,abcd^4+a^2d^5)x^2+2\,(b^2c^3d^2-2\,abc^2d^3+a^2cd^4)x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorithm="fricas")
```

```
[Out] 1/4*((-2*I*A + 3*I*B)*b^2*c^2 - 4*(-I*A + I*B)*a*b*c*d + (-2*I*A + I*B)*a^2
*d^2 - 2*(-I*B*b^2*c*d + I*B*a*b*d^2)*x - 2*(-I*B*b^2*d^2*x^2 - 2*I*B*b^2*c
*d*x - 2*I*B*a*b*c*d + I*B*a^2*d^2)*log((b*x + a)*e/(d*x + c)))/(b^2*c^4*d
- 2*a*b*c^3*d^2 + a^2*c^2*d^3 + (b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*x^2 +
 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*x)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 422 vs. $2(124) = 248$.
time = 1.29, size = 422, normalized size = 2.93

$$-\frac{Bb^2\log\left(x+\frac{-\frac{Ba^3b^2d^3}{(ad-bc)^2}+\frac{3Ba^2b^3cd^2}{(ad-bc)^2}-\frac{3Bab^4c^2d}{(ad-bc)^2}+Bab^2d+\frac{Bb^5c^3}{(ad-bc)^2}+Bb^3c}{2Bb^3d}\right)}{2di^3\left(ad-bc\right)^2}+\frac{Bb^2\log\left(x+\frac{\frac{Ba^3b^2d^3}{(ad-bc)^2}-\frac{3Ba^2b^3cd^2}{(ad-bc)^2}+\frac{3Bab^4c^2d}{(ad-bc)^2}+Bab^2d-\frac{Bb^5c^3}{(ad-bc)^2}+Bb^3c}{2Bb^3d}\right)}{2di^3\left(ad-bc\right)^2}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2c^2di^3+4cd^2i^3x+2d^3i^3x^2}+\frac{-2Aad+2Abc+Bad-3Bbc-2Bbdx}{4ac^2d^2i^3-4bc^3di^3+x^2\cdot\left(4ad^4i^3-4bcd^3i^3\right)+x\left(8acd^3i^3-8bc^2d^2i^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**3,x)
```

```
[Out] -B*b**2*log(x + (-B*a**3*b**2*d**3/(a*d - b*c)**2 + 3*B*a**2*b**3*c*d**2/(a
*d - b*c)**2 - 3*B*a*b**4*c**2*d/(a*d - b*c)**2 + B*a*b**2*d + B*b**5*c**3/
(a*d - b*c)**2 + B*b**3*c)/(2*B*b**3*d))/(2*d*i**3*(a*d - b*c)**2) + B*b**2
*log(x + (B*a**3*b**2*d**3/(a*d - b*c)**2 - 3*B*a**2*b**3*c*d**2/(a*d - b*c
)**2 + 3*B*a*b**4*c**2*d/(a*d - b*c)**2 + B*a*b**2*d - B*b**5*c**3/(a*d - b
*c)**2 + B*b**3*c)/(2*B*b**3*d))/(2*d*i**3*(a*d - b*c)**2) - B*log(e*(a + b
*x)/(c + d*x))/(2*c**2*d*i**3 + 4*c*d**2*i**3*x + 2*d**3*i**3*x**2) + (-2*A
*a*d + 2*A*b*c + B*a*d - 3*B*b*c - 2*B*b*d*x)/(4*a*c**2*d**2*i**3 - 4*b*c**
3*d*i**3 + x**2*(4*a*d**4*i**3 - 4*b*c*d**3*i**3) + x*(8*a*c*d**3*i**3 - 8*
b*c**2*d**2*i**3))
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 249 vs. $2(120) = 240$.
time = 2.81, size = 249, normalized size = 1.73

$$-\frac{\left(-\frac{4i\,(bxe+ae)Bbe\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{4i\,(bxe+ae)Abe}{dx+c}+\frac{4i\,(bxe+ae)Bbe}{dx+c}+\frac{2i\,(bxe+ae)^2Bd\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+\frac{2i\,(bxe+ae)^2Ad}{(dx+c)^2}-\frac{i\,(bxe+ae)^2Bd}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{4\left(bce-ade\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] -1/4*(-4*I*(b*x*e + a*e)*B*b*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 4*I
*(b*x*e + a*e)*A*b*e/(d*x + c) + 4*I*(b*x*e + a*e)*B*b*e/(d*x + c) + 2*I*(b
*x*e + a*e)^2*B*d*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 2*I*(b*x*e + a
*e)^2*A*d/(d*x + c)^2 - I*(b*x*e + a*e)^2*B*d/(d*x + c)^2)*(b*c/((b*c*e - a
*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b*c*e - a*d*e)
```

Mupad [**B**]
time = 5.43, size = 208, normalized size = 1.44

$$\frac{B\,b^2\,\mathrm{atanh}\left(\frac{2\,a^2\,d^3\,i^3-2\,b^2\,c^2\,d\,i^3}{2\,d\,i^3\,{\left(a\,d-b\,c\right)}^2}+\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{d\,i^3\,{\left(a\,d-b\,c\right)}^2}-\frac{B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}{2\,d^2\,i^3\,\left(2\,c\,x+d\,x^2+\frac{c^2}{d}\right)}-\frac{\frac{2\,A\,a\,d-2\,A\,b\,c-B\,a\,d+3\,B\,b\,c}{2\,\left(a\,d-b\,c\right)}+\frac{B\,b\,d\,x}{a\,d-b\,c}}{2\,c^2\,d\,i^3+4\,c\,d^2\,i^3\,x+2\,d^3\,i^3\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(c*i + d*i*x)^3,x)
```

```
[Out] (B*b^2*atanh((2*a^2*d^3*i^3 - 2*b^2*c^2*d*i^3)/(2*d*i^3*(a*d - b*c)^2) + (2
*b*d*x)/(a*d - b*c)))/(d*i^3*(a*d - b*c)^2) - (B*log((e*(a + b*x))/(c + d*x
)))/(2*d^2*i^3*(2*c*x + d*x^2 + c^2/d)) - ((2*A*a*d - 2*A*b*c - B*a*d + 3*B
*b*c)/(2*(a*d - b*c)) + (B*b*d*x)/(a*d - b*c))/(2*c^2*d*i^3 + 2*d^3*i^3*x^2
 + 4*c*d^2*i^3*x)
```

3.51 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)^3}\,dx$

Optimal. Leaf size=243

$$-\frac{B\left(4b-\frac{d(a+bx)}{c+dx}\right)^2}{4(bc-ad)^3gi^3}-\frac{b^2B\log^2\left(\frac{a+bx}{c+dx}\right)}{2(bc-ad)^3gi^3}+\frac{d^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2(bc-ad)^3gi^3(c+dx)^2}-\frac{2bd(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^3gi^3(c+dx)}$$

```
[Out] -1/4*B*(4*b-d*(b*x+a)/(d*x+c))^2/(-a*d+b*c)^3/g/i^3-1/2*b^2*B*ln((b*x+a)/(d
*x+c))^2/(-a*d+b*c)^3/g/i^3+1/2*d^2*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(
-a*d+b*c)^3/g/i^3/(d*x+c)^2-2*b*d*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d
+b*c)^3/g/i^3/(d*x+c)+b^2*ln((b*x+a)/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/(
-a*d+b*c)^3/g/i^3
```

Rubi [A]
time = 0.14, antiderivative size = 243, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 45, 2372, 2338}

$$\frac{b^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{gi^3(bc-ad)^3}+\frac{d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{2bd(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{gi^3(c+dx)(bc-ad)^3}-\frac{b^2B\log^2\left(\frac{a+bx}{c+dx}\right)}{2gi^3(bc-ad)^3}-\frac{B\left(4b-\frac{d(a+bx)}{c+dx}\right)^2}{4gi^3(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)^3),x]
```

```
[Out] -1/4*(B*(4*b - (d*(a + b*x))/(c + d*x))^2)/((b*c - a*d)^3*g*i^3) - (b^2*B*L
og[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^3*g*i^3) + (d^2*(a + b*x)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) - (2*b
*d*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g*i^3*(c
+ d*x)) + (b^2*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/((b*c - a*d)^3*g*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(51c+51dx)^3(ag+bgx)}\,dx = \int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)^3g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)g(c+dx)^3} - \frac{bd\left(A+\right.}{132651(b}\right.$$

$$= \frac{b^3\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{132651(bc-ad)^3g} - \frac{(b^2d)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{132651(bc-ad)^3g} - \frac{(bd)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}}{132651(bc-ad)^2}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{265302(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)}{1326}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{265302(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)}{1326}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{265302(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)}{1326}$$

$$= -\frac{B}{530604(bc-ad)g(c+dx)^2} - \frac{bB}{88434(bc-ad)^2g(c+dx)} - \frac{b^2B\log(a+}{88434(bc-a}$$

$$= -\frac{B}{530604(bc-ad)g(c+dx)^2} - \frac{bB}{88434(bc-ad)^2g(c+dx)} - \frac{b^2B\log(a+}{88434(bc-a}$$

$$= -\frac{B}{530604(bc-ad)g(c+dx)^2} - \frac{bB}{88434(bc-ad)^2g(c+dx)} - \frac{b^2B\log(a+}{88434(bc-a}$$

$$= -\frac{B}{530604(bc-ad)g(c+dx)^2} - \frac{bB}{88434(bc-ad)^2g(c+dx)} - \frac{b^2B\log(a+}{88434(bc-a}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.30, size = 418, normalized size = 1.72

$$\frac{2(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+4b(bc-ad)(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+4b^2(c+dx)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-4b^2(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)-4bB(c+dx)(bc-ad+b(c+dx)\log(a+bx)-b(c+dx)\log(c+dx))-B((bc-ad)^2+2b(bc-ad)(c+dx)+2b^2(c+dx)^2\log(a+bx)-2b^2(c+dx)^2\log(c+dx))-2b^2B(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+2b^2B(c+dx)^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^3gi^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)
^3),x]
```

```
[Out] (2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*b*(b*c - a*d)*(c
+ d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*b^2*(c + d*x)^2*Log[a + b*x
]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*b^2*(c + d*x)^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])*Log[c + d*x] - 4*b*B*(c + d*x)*(b*c - a*d + b*(c + d*x
```

```
)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*b*(b*c -
a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c +
 d*x]) - 2*b^2*B*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*(
c + d*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*
x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^3*g*i^3*(c +
d*x)^2)
```

Maple [A]
time = 0.64, size = 462, normalized size = 1.90 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x,method=_RETURNV
ERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(d^2/e/i^3/(a*d-b*c)^4/g*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))-2*d^3/e^2/i^3/(a*d-b*c)^4/g*A*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/2*d^
4/e^3/i^3/(a*d-b*c)^4/g*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+1/2*d^2/e/i^3/(a*
d-b*c)^4/g*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*d^3/e^2/i^3/(a*d-b*c)^
4/g*B*b*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d
-b*c)*e/d/(d*x+c)-b*e/d)+d^4/e^3/i^3/(a*d-b*c)^4/g*B*(1/2*(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 847 vs. 2(226) = 452.
time = 0.41, size = 847, normalized size = 3.49

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algorit
hm="maxima")
```

```
[Out] 1/2*B*(2*b^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2
+ I*a^3*d^3)*g) - 2*b^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a
^2*b*c*d^2 + I*a^3*d^3)*g) + (2*b*d*x + 3*b*c - a*d)/((-I*b^2*c^2*d^2 + 2*I
*a*b*c*d^3 - I*a^2*d^4)*g*x^2 + 2*(-I*b^2*c^3*d + 2*I*a*b*c^2*d^2 - I*a^2*c
*d^3)*g*x + (-I*b^2*c^4 + 2*I*a*b*c^3*d - I*a^2*c^2*d^2)*g))*log(b*x*e/(d*x
 + c) + a*e/(d*x + c)) + 1/2*A*(2*b^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2
*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) - 2*b^2*log(d*x + c)/((-I*b^3*c^3
+ 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) + (2*b*d*x + 3*b*c - a*
d)/((-I*b^2*c^2*d^2 + 2*I*a*b*c*d^3 - I*a^2*d^4)*g*x^2 + 2*(-I*b^2*c^3*d +
2*I*a*b*c^2*d^2 - I*a^2*c*d^3)*g*x + (-I*b^2*c^4 + 2*I*a*b*c^3*d - I*a^2*c^
2*d^2)*g)) - 1/4*(7*I*b^2*c^2 - 8*I*a*b*c*d + I*a^2*d^2 - 2*(-I*b^2*d^2*x^2
 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^2*
```

```
c*d*x - I*b^2*c^2)*log(d*x + c)^2 - 6*(-I*b^2*c*d + I*a*b*d^2)*x - 6*(-I*b^
2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a) - 2*(3*I*b^2*d^2*x^2 +
6*I*b^2*c*d*x + 3*I*b^2*c^2 + 2*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)
*log(b*x + a))*log(d*x + c))*B/(b^3*c^5*g - 3*a*b^2*c^4*d*g + 3*a^2*b*c^3*d
^2*g - a^3*c^2*d^3*g + (b^3*c^3*d^2*g - 3*a*b^2*c^2*d^3*g + 3*a^2*b*c*d^4*g
 - a^3*d^5*g)*x^2 + 2*(b^3*c^4*d*g - 3*a*b^2*c^3*d^2*g + 3*a^2*b*c^2*d^3*g
- a^3*c*d^4*g)*x)
```

Fricas [**A**]
time = 0.37, size = 350, normalized size = 1.44

$$-\frac{(-6i\,A+7i\,B)b^2c^2-8\,(-i\,A+i\,B)abcd+(-2i\,A+i\,B)a^2d^2-2\,(i\,Bb^2d^2x^2+2i\,Bb^2cdx+i\,Bb^2c^2)\log\left(\frac{(bx+a)e}{dx+c}\right)^2-2\,((2i\,A-3i\,B)b^2cd+(-2i\,A+3i\,B)abd^2)x-2\,((2i\,A-3i\,B)b^2d^2x^2+2i\,Ab^2c^2-4i\,Babcd+i\,Ba^2d^2+2\,(2\,(i\,A-i\,B)b^2cd-i\,Babd^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4\,((b^3c^3d^2-3\,ab^2c^2d^3+3\,a^2bcd^4-a^3d^5)gx^2+2\,(b^3c^4d-3\,ab^2c^3d^2+3\,a^2bc^2d^3-a^3cd^4)gx+(b^3c^5-3\,ab^2c^4d+3\,a^2bc^3d^2-a^3c^2d^3)g)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algorit
hm="fricas")
```

```
[Out] -1/4*((-6*I*A + 7*I*B)*b^2*c^2 - 8*(-I*A + I*B)*a*b*c*d + (-2*I*A + I*B)*a^
2*d^2 - 2*(I*B*b^2*d^2*x^2 + 2*I*B*b^2*c*d*x + I*B*b^2*c^2)*log((b*x + a)*e
/(d*x + c))^2 - 2*((2*I*A - 3*I*B)*b^2*c*d + (-2*I*A + 3*I*B)*a*b*d^2)*x -
2*((2*I*A - 3*I*B)*b^2*d^2*x^2 + 2*I*A*b^2*c^2 - 4*I*B*a*b*c*d + I*B*a^2*d^
2 + 2*(2*(I*A - I*B)*b^2*c*d - I*B*a*b*d^2)*x)*log((b*x + a)*e/(d*x + c)))/
((b^3*c^3*d^2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c*d^4 - a^3*d^5)*g*x^2 + 2*(b^3*c
^4*d - 3*a*b^2*c^3*d^2 + 3*a^2*b*c^2*d^3 - a^3*c*d^4)*g*x + (b^3*c^5 - 3*a*
b^2*c^4*d + 3*a^2*b*c^3*d^2 - a^3*c^2*d^3)*g)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 889 vs. $2(207) = 414$.
time = 3.66, size = 889, normalized size = 3.66

$$-\frac{Bb^2\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2a^3d^3gi^3-6a^2bcd^2gi^3+6ab^2c^2dgi^3-2b^3c^3gi^3}+\frac{b^2\cdot(2A-3B)\log\left(x+\frac{2Aab^2d+2Ab^3c-3Bab^2d-3Bb^3c-\frac{a^4b^2d^4\cdot(2A-3B)}{(ad-bc)^3}+\frac{4a^3b^3cd^3\cdot(2A-3B)}{(ad-bc)^3}-\frac{6a^2b^4c^2d^2\cdot(2A-3B)}{(ad-bc)^3}+\frac{4ab^5c^3d(2A-3B)}{(ad-bc)^3}-\frac{b^6c^4\cdot(2A-3B)}{(ad-bc)^3}}{4Ab^3d-6Bb^3d}\right)}{2gi^3\,(ad-bc)^3}-\frac{b^2\cdot(2A-3B)\log\left(x+\frac{2Aab^2d+2Ab^3c-3Bab^2d-3Bb^3c+\frac{a^4b^2d^4\cdot(2A-3B)}{(ad-bc)^3}-\frac{4a^3b^3cd^3\cdot(2A-3B)}{(ad-bc)^3}+\frac{6a^2b^4c^2d^2\cdot(2A-3B)}{(ad-bc)^3}-\frac{4ab^5c^3d(2A-3B)}{(ad-bc)^3}+\frac{b^6c^4\cdot(2A-3B)}{(ad-bc)^3}}{4Ab^3d-6Bb^3d}\right)}{2gi^3\,(ad-bc)^3}+\frac{(-Bad+3Bbc+2Bbdx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2a^2c^2d^2gi^3+4a^2cd^3gi^3x+2a^2d^4gi^3x^2-4abc^3dgi^3-8abc^2d^2gi^3x-4abcd^3gi^3x^2+2b^2c^4gi^3+4b^2c^3dgi^3x+2b^2c^2d^2gi^3x^2}+\frac{-2Aad+6Abc+Bad-7Bbc+x(4Abd-6Bbd)}{4a^2c^2d^2gi^3-8abc^3dgi^3+4b^2c^4gi^3+x^2\cdot(4a^2d^4gi^3-8abcd^3gi^3+4b^2c^2d^2gi^3)+x\,(8a^2cd^3gi^3-16abc^2d^2gi^3+8b^2c^3dgi^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)**3,x)
```

```
[Out] -B*b**2*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*d**3*g*i**3 - 6*a**2*b*c*d**2
*g*i**3 + 6*a*b**2*c**2*d*g*i**3 - 2*b**3*c**3*g*i**3) + b**2*(2*A - 3*B)*l
og(x + (2*A*a*b**2*d + 2*A*b**3*c - 3*B*a*b**2*d - 3*B*b**3*c - a**4*b**2*d
**4*(2*A - 3*B)/(a*d - b*c)**3 + 4*a**3*b**3*c*d**3*(2*A - 3*B)/(a*d - b*c)
**3 - 6*a**2*b**4*c**2*d**2*(2*A - 3*B)/(a*d - b*c)**3 + 4*a*b**5*c**3*d*(2
*A - 3*B)/(a*d - b*c)**3 - b**6*c**4*(2*A - 3*B)/(a*d - b*c)**3)/(4*A*b**3*
d - 6*B*b**3*d))/(2*g*i**3*(a*d - b*c)**3) - b**2*(2*A - 3*B)*log(x + (2*A*
a*b**2*d + 2*A*b**3*c - 3*B*a*b**2*d - 3*B*b**3*c + a**4*b**2*d**4*(2*A - 3
*B)/(a*d - b*c)**3 - 4*a**3*b**3*c*d**3*(2*A - 3*B)/(a*d - b*c)**3 + 6*a**2
*b**4*c**2*d**2*(2*A - 3*B)/(a*d - b*c)**3 - 4*a*b**5*c**3*d*(2*A - 3*B)/(a
*d - b*c)**3 + b**6*c**4*(2*A - 3*B)/(a*d - b*c)**3)/(4*A*b**3*d - 6*B*b**3
```

```
*d))/(2*g*i**3*(a*d - b*c)**3) + (-B*a*d + 3*B*b*c + 2*B*b*d*x)*log(e*(a +
b*x)/(c + d*x))/(2*a**2*c**2*d**2*g*i**3 + 4*a**2*c*d**3*g*i**3*x + 2*a**2*
d**4*g*i**3*x**2 - 4*a*b*c**3*d*g*i**3 - 8*a*b*c**2*d**2*g*i**3*x - 4*a*b*c
*d**3*g*i**3*x**2 + 2*b**2*c**4*g*i**3 + 4*b**2*c**3*d*g*i**3*x + 2*b**2*c*
*2*d**2*g*i**3*x**2) + (-2*A*a*d + 6*A*b*c + B*a*d - 7*B*b*c + x*(4*A*b*d -
 6*B*b*d))/(4*a**2*c**2*d**2*g*i**3 - 8*a*b*c**3*d*g*i**3 + 4*b**2*c**4*g*i
**3 + x**2*(4*a**2*d**4*g*i**3 - 8*a*b*c*d**3*g*i**3 + 4*b**2*c**2*d**2*g*i
**3) + x*(8*a**2*c*d**3*g*i**3 - 16*a*b*c**2*d**2*g*i**3 + 8*b**2*c**3*d*g*
i**3))
```

Giac [A]

time = 6.18, size = 332, normalized size = 1.37

$$\frac{\left(2i\,Bb^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)^2+4i\,Ab^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{8i\,(bxe+ae)Bbde\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{8i\,(bxe+ae)Abde}{dx+c}+\frac{8i\,(bxe+ae)Bbde}{dx+c}+\frac{2i\,(bxe+ae)^2Bd^2\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+\frac{2i\,(bxe+ae)^2Ad^2}{(dx+c)^2}-\frac{i\,(bxe+ae)^2Bd^2}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{4\,(b^2c^2ge-2\,abcdge+a^2d^2ge)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algorit
hm="giac")
```

```
[Out] 1/4*(2*I*B*b^2*e^2*log((b*x*e + a*e)/(d*x + c))^2 + 4*I*A*b^2*e^2*log((b*x*
e + a*e)/(d*x + c)) - 8*I*(b*x*e + a*e)*B*b*d*e*log((b*x*e + a*e)/(d*x + c)
)/(d*x + c) - 8*I*(b*x*e + a*e)*A*b*d*e/(d*x + c) + 8*I*(b*x*e + a*e)*B*b*d
*e/(d*x + c) + 2*I*(b*x*e + a*e)^2*B*d^2*log((b*x*e + a*e)/(d*x + c))/(d*x
+ c)^2 + 2*I*(b*x*e + a*e)^2*A*d^2/(d*x + c)^2 - I*(b*x*e + a*e)^2*B*d^2/(d
*x + c)^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c -
 a*d)))/(b^2*c^2*g*e - 2*a*b*c*d*g*e + a^2*d^2*g*e)
```

Mupad [B]

time = 7.08, size = 545, normalized size = 2.24

$$\frac{3\,A\,b\,c}{2\,g\,i^3\,{\left(a\,d-b\,c\right)}^2\,{\left(c+d\,x\right)}^2}-\frac{A\,a\,d}{2\,g\,i^3\,{\left(a\,d-b\,c\right)}^2\,{\left(c+d\,x\right)}^2}-\frac{B\,b^2\,{\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}^2}{2\,g\,i^3\,{\left(a\,d-b\,c\right)}^3}+\frac{B\,a\,d}{4\,g\,i^3\,{\left(a\,d-b\,c\right)}^2\,{\left(c+d\,x\right)}^2}-\frac{7\,B\,b\,c}{4\,g\,i^3\,{\left(a\,d-b\,c\right)}^2\,{\left(c+d\,x\right)}^2}-\frac{B\,a^2\,d^2\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}{2\,g\,i^3\,{\left(a\,d-b\,c\right)}^3\,{\left(c+d\,x\right)}^2}-\frac{3\,B\,b^2\,c^2\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}{2\,g\,i^3\,{\left(a\,d-b\,c\right)}^3\,{\left(c+d\,x\right)}^2}+\frac{A\,b\,d\,x}{g\,i^3\,{\left(a\,d-b\,c\right)}^2\,{\left(c+d\,x\right)}^2}-\frac{3\,B\,b\,d\,x}{2\,g\,i^3\,{\left(a\,d-b\,c\right)}^2\,{\left(c+d\,x\right)}^2}+\frac{B\,a\,b\,d^2\,x\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}{g\,i^3\,{\left(a\,d-b\,c\right)}^3\,{\left(c+d\,x\right)}^2}-\frac{B\,b^2\,c\,d\,x\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}{g\,i^3\,{\left(a\,d-b\,c\right)}^3\,{\left(c+d\,x\right)}^2}+\frac{2\,B\,a\,b\,c\,d\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}{g\,i^3\,{\left(a\,d-b\,c\right)}^3\,{\left(c+d\,x\right)}^2}+\frac{A\,b^2\,\mathrm{atan}\left(\frac{a\,d\,1{}\mathrm{i}+b\,c\,1{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}\right)\,2{}\mathrm{i}}{g\,i^3\,{\left(a\,d-b\,c\right)}^3}-\frac{B\,b^2\,\mathrm{atan}\left(\frac{a\,d\,1{}\mathrm{i}+b\,c\,1{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}\right)\,3{}\mathrm{i}}{g\,i^3\,{\left(a\,d-b\,c\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/((a*g + b*g*x)*(c*i + d*i*x)^3),x)
```

```
[Out] (A*b^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(g*i^3*(a*d - b*c
)^3) - (B*b^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*3i)/(g*i^3*(a*
d - b*c)^3) - (B*b^2*log((e*(a + b*x))/(c + d*x))^2)/(2*g*i^3*(a*d - b*c)^3
) - (A*a*d)/(2*g*i^3*(a*d - b*c)^2*(c + d*x)^2) + (3*A*b*c)/(2*g*i^3*(a*d -
 b*c)^2*(c + d*x)^2) + (B*a*d)/(4*g*i^3*(a*d - b*c)^2*(c + d*x)^2) - (7*B*b
*c)/(4*g*i^3*(a*d - b*c)^2*(c + d*x)^2) - (B*a^2*d^2*log((e*(a + b*x))/(c +
 d*x)))/(2*g*i^3*(a*d - b*c)^3*(c + d*x)^2) - (3*B*b^2*c^2*log((e*(a + b*x)
)/(c + d*x)))/(2*g*i^3*(a*d - b*c)^3*(c + d*x)^2) + (A*b*d*x)/(g*i^3*(a*d -
 b*c)^2*(c + d*x)^2) - (3*B*b*d*x)/(2*g*i^3*(a*d - b*c)^2*(c + d*x)^2) + (B
*a*b*d^2*x*log((e*(a + b*x))/(c + d*x)))/(g*i^3*(a*d - b*c)^3*(c + d*x)^2)
- (B*b^2*c*d*x*log((e*(a + b*x))/(c + d*x)))/(g*i^3*(a*d - b*c)^3*(c + d*x)
^2) + (2*B*a*b*c*d*log((e*(a + b*x))/(c + d*x)))/(g*i^3*(a*d - b*c)^3*(c +
d*x)^2)
```

3.52 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)^3}\,dx$

Optimal. Leaf size=365

$$\frac{Bd^3(a+bx)^2}{4(bc-ad)^4g^2i^3(c+dx)^2}-\frac{3bBd^2(a+bx)}{(bc-ad)^4g^2i^3(c+dx)}-\frac{b^3B(c+dx)}{(bc-ad)^4g^2i^3(a+bx)}+\frac{3b^2Bd\log^2\left(\frac{a+bx}{c+dx}\right)}{2(bc-ad)^4g^2i^3}-\frac{d^3(a+bx)^2}{2(bc-}$$

```
[Out] 1/4*B*d^3*(b*x+a)^2/(-a*d+b*c)^4/g^2/i^3/(d*x+c)^2-3*b*B*d^2*(b*x+a)/(-a*d+
b*c)^4/g^2/i^3/(d*x+c)-b^3*B*(d*x+c)/(-a*d+b*c)^4/g^2/i^3/(b*x+a)+3/2*b^2*B
*d*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^4/g^2/i^3-1/2*d^3*(b*x+a)^2*(A+B*ln(e*(
b*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^2/i^3/(d*x+c)^2+3*b*d^2*(b*x+a)*(A+B*ln(e*(
b*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^2/i^3/(d*x+c)-b^3*(d*x+c)*(A+B*ln(e*(b*x+a)
/(d*x+c)))/(-a*d+b*c)^4/g^2/i^3/(b*x+a)-3*b^2*d*ln((b*x+a)/(d*x+c))*(A+B*ln
(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^2/i^3
```

Rubi [A]
time = 0.17, antiderivative size = 365, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 45, 2372, 2338}

$$-\frac{b^3(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{3b^2d\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(bc-ad)^4}-\frac{d^3(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^2i^3(c+dx)^2(bc-ad)^4}+\frac{3bd^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(c+dx)(bc-ad)^4}-\frac{b^3B(c+dx)}{g^2i^3(a+bx)(bc-ad)^4}+\frac{3b^2Bd\log^2\left(\frac{a+bx}{c+dx}\right)}{2g^2i^3(bc-ad)^4}+\frac{Bd^3(a+bx)^2}{4g^2i^3(c+dx)^2(bc-ad)^4}-\frac{3bBd^2(a+bx)}{g^2i^3(c+dx)(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*x)^3),
x]
```

```
[Out] (B*d^3*(a + b*x)^2)/(4*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (3*b*B*d^2*(a +
 b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*B*(c + d*x))/((b*c - a*d)^4
*g^2*i^3*(a + b*x)) + (3*b^2*B*d*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)
^4*g^2*i^3) - (d^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*
c - a*d)^4*g^2*i^3*(c + d*x)^2) + (3*b*d^2*(a + b*x)*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*(c + d*x)*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3*(a + b*x)) - (3*b^2*d*
Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)
^4*g^2*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(52c+52dx)^3(ag+bgx)^2}\,dx = \int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^3g^2(a+bx)^2} - \frac{3b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^4g^2(a+bx)} + \frac{d^2(}{1406}\right.$$

$$= -\frac{(3b^3d)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{140608(bc-ad)^4g^2} + \frac{(3b^2d^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{140608(bc-ad)^4g^2} + \frac{b^3\int \frac{A+B\log}{(a+}}{140608(bc}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{281216(bc-ad)^2g^2(c+dx)^2} - \frac{bd(A+}{70304(b}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{281216(bc-ad)^2g^2(c+dx)^2} - \frac{bd(A+}{70304(b}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{281216(bc-ad)^2g^2(c+dx)^2} - \frac{bd(A+}{70304(b}$$

$$= -\frac{b^2B}{140608(bc-ad)^3g^2(a+bx)} + \frac{Bd}{562432(bc-ad)^2g^2(c+dx)^2} + \frac{}{281216(}$$

$$= -\frac{b^2B}{140608(bc-ad)^3g^2(a+bx)} + \frac{Bd}{562432(bc-ad)^2g^2(c+dx)^2} + \frac{}{281216(}$$

$$= -\frac{b^2B}{140608(bc-ad)^3g^2(a+bx)} + \frac{Bd}{562432(bc-ad)^2g^2(c+dx)^2} + \frac{}{281216(}$$

$$= -\frac{b^2B}{140608(bc-ad)^3g^2(a+bx)} + \frac{Bd}{562432(bc-ad)^2g^2(c+dx)^2} + \frac{}{281216(}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.48, size = 452, normalized size = 1.24

$$\frac{-\frac{4b^3Bc}{a+bx} + \frac{4ab^2Bd}{a+bx} + \frac{Bd(bc-ad)^2}{(c+dx)^2} + \frac{8b^2Bcd}{c+dx} - \frac{8abBd^2}{c+dx} + \frac{2bBd(bc-ad)}{c+dx} + 6b^2Bd\log(a+bx) - \frac{4b^2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx} - \frac{2d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(c+dx)^2} - \frac{8bd(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx} - 12b^2d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) - 6b^2Bd\log(c+dx) + 12b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx) + 6b^2Bd\left(\log(a+bx)\left(\log(a+bx) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right) - 6b^2Bd\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right) - \log(c+dx)\right)\log(c+dx) + 2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^4g^2i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*
x)^3),x]
```

```
[Out] ((-4*b^3*B*c)/(a + b*x) + (4*a*b^2*B*d)/(a + b*x) + (B*d*(b*c - a*d)^2)/(c
 + d*x)^2 + (8*b^2*B*c*d)/(c + d*x) - (8*a*b*B*d^2)/(c + d*x) + (2*b*B*d*(b*
c - a*d))/(c + d*x) + 6*b^2*B*d*Log[a + b*x] - (4*b^2*(b*c - a*d)*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(a + b*x) - (2*d*(b*c - a*d)^2*(A + B*Log[(e*(
```

```
a + b*x))/(c + d*x)]))/(c + d*x)^2 - (8*b*d*(b*c - a*d)*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(c + d*x) - 12*b^2*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x
))/(c + d*x)]) - 6*b^2*B*d*Log[c + d*x] + 12*b^2*d*(A + B*Log[(e*(a + b*x))
/(c + d*x)])*Log[c + d*x] + 6*b^2*B*d*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(
b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) -
6*b^2*B*d*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^4*g^2*i^3)
```

Maple [A]
time = 0.71, size = 632, normalized size = 1.73 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(d^2/i^3/(a*d-b*c)^5/g^2*A*b^3/(b*e/d+(a*d-b*c)*e/d/(d*x
+c))+3*d^3/e/i^3/(a*d-b*c)^5/g^2*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-3*d^
4/e^2/i^3/(a*d-b*c)^5/g^2*A*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/2*d^5/e^3/i^3
/(a*d-b*c)^5/g^2*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-d^2/i^3/(a*d-b*c)^5/g^2*
B*b^3*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/(
b*e/d+(a*d-b*c)*e/d/(d*x+c)))+3/2*d^3/e/i^3/(a*d-b*c)^5/g^2*B*b^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))^2-3*d^4/e^2/i^3/(a*d-b*c)^5/g^2*B*b*((b*e/d+(a*d-b*c
)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d)
+d^5/e^3/i^3/(a*d-b*c)^5/g^2*B*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1659 vs. 2(339) = 678.
time = 0.56, size = 1659, normalized size = 4.55

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] 1/2*B*(6*b^2*d*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2
*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) - 6*b^2*d*log(d*x + c)/((I*b^4*c^4
 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2
) + (6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d
^2)*x)/((I*b^4*c^3*d^2 - 3*I*a*b^3*c^2*d^3 + 3*I*a^2*b^2*c*d^4 - I*a^3*b*d^
5)*g^2*x^3 + (2*I*b^4*c^4*d - 5*I*a*b^3*c^3*d^2 + 3*I*a^2*b^2*c^2*d^3 + I*a
^3*b*c*d^4 - I*a^4*d^5)*g^2*x^2 + (I*b^4*c^5 - I*a*b^3*c^4*d - 3*I*a^2*b^2*
c^3*d^2 + 5*I*a^3*b*c^2*d^3 - 2*I*a^4*c*d^4)*g^2*x + (I*a*b^3*c^5 - 3*I*a^2
*b^2*c^4*d + 3*I*a^3*b*c^3*d^2 - I*a^4*c^2*d^3)*g^2))*log(b*x*e/(d*x + c) +
 a*e/(d*x + c)) + 1/2*A*(6*b^2*d*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d
```

```
 + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) - 6*b^2*d*log(d*
x + c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^
3 + I*a^4*d^4)*g^2) + (6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*
(3*b^2*c*d + a*b*d^2)*x)/((I*b^4*c^3*d^2 - 3*I*a*b^3*c^2*d^3 + 3*I*a^2*b^2*
c*d^4 - I*a^3*b*d^5)*g^2*x^3 + (2*I*b^4*c^4*d - 5*I*a*b^3*c^3*d^2 + 3*I*a^2
*b^2*c^2*d^3 + I*a^3*b*c*d^4 - I*a^4*d^5)*g^2*x^2 + (I*b^4*c^5 - I*a*b^3*c^
4*d - 3*I*a^2*b^2*c^3*d^2 + 5*I*a^3*b*c^2*d^3 - 2*I*a^4*c*d^4)*g^2*x + (I*a
*b^3*c^5 - 3*I*a^2*b^2*c^4*d + 3*I*a^3*b*c^3*d^2 - I*a^4*c^2*d^3)*g^2)) + 1
/4*(-4*I*b^3*c^3 + 15*I*a*b^2*c^2*d - 12*I*a^2*b*c*d^2 + I*a^3*d^3 - 6*(-I*
b^3*c*d^2 + I*a*b^2*d^3)*x^2 - 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^
3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(b*x +
a)^2 - 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x
^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(d*x + c)^2 - 3*(-I*b^3*c^2*d -
 2*I*a*b^2*c*d^2 + 3*I*a^2*b*d^3)*x - 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (
-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log
(b*x + a) - 6*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^2*d^3
)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x + 2*(I*b^3*d^3*x^3 + I*a*b^2*c^2*
d + (2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x)*
log(b*x + a))*log(d*x + c))*B/(a*b^4*c^6*g^2 - 4*a^2*b^3*c^5*d*g^2 + 6*a^3*
b^2*c^4*d^2*g^2 - 4*a^4*b*c^3*d^3*g^2 + a^5*c^2*d^4*g^2 + (b^5*c^4*d^2*g^2
- 4*a*b^4*c^3*d^3*g^2 + 6*a^2*b^3*c^2*d^4*g^2 - 4*a^3*b^2*c*d^5*g^2 + a^4*b
*d^6*g^2)*x^3 + (2*b^5*c^5*d*g^2 - 7*a*b^4*c^4*d^2*g^2 + 8*a^2*b^3*c^3*d^3*
g^2 - 2*a^3*b^2*c^2*d^4*g^2 - 2*a^4*b*c*d^5*g^2 + a^5*d^6*g^2)*x^2 + (b^5*c
^6*g^2 - 2*a*b^4*c^5*d*g^2 - 2*a^2*b^3*c^4*d^2*g^2 + 8*a^3*b^2*c^3*d^3*g^2
- 7*a^4*b*c^2*d^4*g^2 + 2*a^5*c*d^5*g^2)*x)
```

Fricas [A]
time = 0.41, size = 676, normalized size = 1.85

$$-\frac{4\,(i\,A+i\,B)b^3c^3+3\,(2i\,A-5i\,B)ab^2c^2d+12\,(-i\,A+i\,B)a^2bcd^2-(-2i\,A+i\,B)a^3d^3+6\,((2i\,A-i\,B)b^3cd^2+(-2i\,A+i\,B)ab^2d^3)x^2+6\,(i\,Bb^3d^3x^3+i\,Bab^2c^2d+(2i\,Bb^3cd^2+i\,Bab^2d^3)x^2+(i\,Bb^3c^2d+2i\,Bab^2cd^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)^2+3\,((6i\,A-i\,B)b^3c^2d+2\,(-2i\,A-i\,B)ab^2cd^2+(-2i\,A+3i\,B)a^2bd^3)x+2\,(3\,(2i\,A-i\,B)b^3d^3x^3+2i\,Bb^3c^3+6i\,Aab^2c^2d-6i\,Ba^2bcd^2+i\,Ba^3d^3+3\,(4i\,Ab^3cd^2+(2i\,A-3i\,B)ab^2d^3)x^2+3\,(2\,(i\,A+i\,B)b^3c^2d+4\,(i\,A-i\,B)ab^2cd^2-i\,Ba^2bd^3)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4\,((b^5c^4d^2-4\,ab^4c^3d^3+6\,a^2b^3c^2d^4-4\,a^3b^2cd^5+a^4bd^6)g^2x^3+(2\,b^5c^5d-7\,ab^4c^4d^2+8\,a^2b^3c^3d^3-2\,a^3b^2c^2d^4-2\,a^4bcd^5+a^5d^6)g^2x^2+(b^5c^6-2\,ab^4c^5d-2\,a^2b^3c^4d^2+8\,a^3b^2c^3d^3-7\,a^4bc^2d^4+2\,a^5cd^5)g^2x+(ab^4c^6-4\,a^2b^3c^5d+6\,a^3b^2c^4d^2-4\,a^4bc^3d^3+a^5c^2d^4)g^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] -1/4*(4*(I*A + I*B)*b^3*c^3 + 3*(2*I*A - 5*I*B)*a*b^2*c^2*d + 12*(-I*A + I*
B)*a^2*b*c*d^2 - (-2*I*A + I*B)*a^3*d^3 + 6*((2*I*A - I*B)*b^3*c*d^2 + (-2*
I*A + I*B)*a*b^2*d^3)*x^2 + 6*(I*B*b^3*d^3*x^3 + I*B*a*b^2*c^2*d + (2*I*B*b
^3*c*d^2 + I*B*a*b^2*d^3)*x^2 + (I*B*b^3*c^2*d + 2*I*B*a*b^2*c*d^2)*x)*log(
(b*x + a)*e/(d*x + c))^2 + 3*((6*I*A - I*B)*b^3*c^2*d + 2*(-2*I*A - I*B)*a*
b^2*c*d^2 + (-2*I*A + 3*I*B)*a^2*b*d^3)*x + 2*(3*(2*I*A - I*B)*b^3*d^3*x^3
+ 2*I*B*b^3*c^3 + 6*I*A*a*b^2*c^2*d - 6*I*B*a^2*b*c*d^2 + I*B*a^3*d^3 + 3*(
4*I*A*b^3*c*d^2 + (2*I*A - 3*I*B)*a*b^2*d^3)*x^2 + 3*(2*(I*A + I*B)*b^3*c^2
*d + 4*(I*A - I*B)*a*b^2*c*d^2 - I*B*a^2*b*d^3)*x)*log((b*x + a)*e/(d*x + c
)))/((b^5*c^4*d^2 - 4*a*b^4*c^3*d^3 + 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c*d^5 +
```

```
 a^4*b*d^6)*g^2*x^3 + (2*b^5*c^5*d - 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3 -
2*a^3*b^2*c^2*d^4 - 2*a^4*b*c*d^5 + a^5*d^6)*g^2*x^2 + (b^5*c^6 - 2*a*b^4*c
^5*d - 2*a^2*b^3*c^4*d^2 + 8*a^3*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^
5)*g^2*x + (a*b^4*c^6 - 4*a^2*b^3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d
^3 + a^5*c^2*d^4)*g^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^2*(I*d*x + I*c)
^3), x)
```

Mupad [**B**]
time = 9.29, size = 983, normalized size = 2.69

$$\frac{A b^2 c^2}{g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}-\frac{A a^2 d^2}{2 g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}-\frac{3 B b^2 d \ln\left(\frac{e(a+bx)}{c+dx}\right)^2}{2 g^2 i^3 (ad-bc)^4}+\frac{B a^2 d^2}{4 g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}+\frac{B b^2 c^2}{g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}-\frac{B a d \ln\left(\frac{e(a+bx)}{c+dx}\right)}{2 g^2 i^3 (ad-bc)^2 (a+bx) (c+dx)^2}-\frac{B b c \ln\left(\frac{e(a+bx)}{c+dx}\right)}{g^2 i^3 (ad-bc)^2 (a+bx) (c+dx)^2}+\frac{3 A b^2 d^2 x^2}{g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}-\frac{3 B b^2 d^2 x^2}{2 g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}+\frac{5 A a b c d}{2 g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}-\frac{11 B a b c d}{4 g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}-\frac{3 B b d x \ln\left(\frac{e(a+bx)}{c+dx}\right)}{2 g^2 i^3 (ad-bc)^2 (a+bx) (c+dx)^2}+\frac{3 B b^2 d^2 x^2 \ln\left(\frac{e(a+bx)}{c+dx}\right)}{g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}+\frac{3 A a b d^2 x}{2 g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}-\frac{9 B a b d^2 x}{4 g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}+\frac{9 A b^2 c d x}{2 g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}-\frac{3 B b^2 c d x}{4 g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}+\frac{3 B a b c d \ln\left(\frac{e(a+bx)}{c+dx}\right)}{g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}+\frac{3 B a b d^2 x \ln\left(\frac{e(a+bx)}{c+dx}\right)}{g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}+\frac{3 B b^2 c d x \ln\left(\frac{e(a+bx)}{c+dx}\right)}{g^2 i^3 (ad-bc)^3 (a+bx) (c+dx)^2}+\frac{A b^2 d \operatorname{atan}\left(\frac{a d 1i+b c 1i+b d x 2i}{ad-bc}\right) 6i}{g^2 i^3 (ad-bc)^4}-\frac{B b^2 d \operatorname{atan}\left(\frac{a d 1i+b c 1i+b d x 2i}{ad-bc}\right) 3i}{g^2 i^3 (ad-bc)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/((a*g + b*g*x)^2*(c*i + d*i*x)^3),
x)
```

```
[Out] (A*b^2*d*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*6i)/(g^2*i^3*(a*d -
 b*c)^4) - (3*B*b^2*d*log((e*(a + b*x))/(c + d*x))^2)/(2*g^2*i^3*(a*d - b*c
)^4) - (B*b^2*d*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*3i)/(g^2*i^3
*(a*d - b*c)^4) - (A*a^2*d^2)/(2*g^2*i^3*(a*d - b*c)^3*(a + b*x)*(c + d*x)^
2) + (A*b^2*c^2)/(g^2*i^3*(a*d - b*c)^3*(a + b*x)*(c + d*x)^2) + (B*a^2*d^2
)/(4*g^2*i^3*(a*d - b*c)^3*(a + b*x)*(c + d*x)^2) + (B*b^2*c^2)/(g^2*i^3*(a
*d - b*c)^3*(a + b*x)*(c + d*x)^2) - (B*a*d*log((e*(a + b*x))/(c + d*x)))/(
2*g^2*i^3*(a*d - b*c)^2*(a + b*x)*(c + d*x)^2) - (B*b*c*log((e*(a + b*x))/(
c + d*x)))/(g^2*i^3*(a*d - b*c)^2*(a + b*x)*(c + d*x)^2) + (3*A*b^2*d^2*x^2
```

```
)/(g^2*i^3*(a*d - b*c)^3*(a + b*x)*(c + d*x)^2) - (3*B*b^2*d^2*x^2)/(2*g^2*
i^3*(a*d - b*c)^3*(a + b*x)*(c + d*x)^2) + (5*A*a*b*c*d)/(2*g^2*i^3*(a*d -
b*c)^3*(a + b*x)*(c + d*x)^2) - (11*B*a*b*c*d)/(4*g^2*i^3*(a*d - b*c)^3*(a
+ b*x)*(c + d*x)^2) - (3*B*b*d*x*log((e*(a + b*x))/(c + d*x)))/(2*g^2*i^3*(
a*d - b*c)^2*(a + b*x)*(c + d*x)^2) + (3*B*b^2*d^2*x^2*log((e*(a + b*x))/(c
 + d*x)))/(g^2*i^3*(a*d - b*c)^3*(a + b*x)*(c + d*x)^2) + (3*A*a*b*d^2*x)/(
2*g^2*i^3*(a*d - b*c)^3*(a + b*x)*(c + d*x)^2) - (9*B*a*b*d^2*x)/(4*g^2*i^3
*(a*d - b*c)^3*(a + b*x)*(c + d*x)^2) + (9*A*b^2*c*d*x)/(2*g^2*i^3*(a*d - b
*c)^3*(a + b*x)*(c + d*x)^2) - (3*B*b^2*c*d*x)/(4*g^2*i^3*(a*d - b*c)^3*(a
+ b*x)*(c + d*x)^2) + (3*B*a*b*c*d*log((e*(a + b*x))/(c + d*x)))/(g^2*i^3*(
a*d - b*c)^3*(a + b*x)*(c + d*x)^2) + (3*B*a*b*d^2*x*log((e*(a + b*x))/(c +
 d*x)))/(g^2*i^3*(a*d - b*c)^3*(a + b*x)*(c + d*x)^2) + (3*B*b^2*c*d*x*log(
(e*(a + b*x))/(c + d*x)))/(g^2*i^3*(a*d - b*c)^3*(a + b*x)*(c + d*x)^2)
```

3.53 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)^3}\,dx$

Optimal. Leaf size=463

$$-\frac{Bd^4(a+bx)^2}{4(bc-ad)^5g^3i^3(c+dx)^2}+\frac{4bBd^3(a+bx)}{(bc-ad)^5g^3i^3(c+dx)}+\frac{4b^3Bd(c+dx)}{(bc-ad)^5g^3i^3(a+bx)}-\frac{b^4B(c+dx)^2}{4(bc-ad)^5g^3i^3(a+bx)^2}-3b$$

```
[Out] -1/4*B*d^4*(b*x+a)^2/(-a*d+b*c)^5/g^3/i^3/(d*x+c)^2+4*b*B*d^3*(b*x+a)/(-a*d
+b*c)^5/g^3/i^3/(d*x+c)+4*b^3*B*d*(d*x+c)/(-a*d+b*c)^5/g^3/i^3/(b*x+a)-1/4*
b^4*B*(d*x+c)^2/(-a*d+b*c)^5/g^3/i^3/(b*x+a)^2-3*b^2*B*d^2*ln((b*x+a)/(d*x+
c))^2/(-a*d+b*c)^5/g^3/i^3+1/2*d^4*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-
a*d+b*c)^5/g^3/i^3/(d*x+c)^2-4*b*d^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-
a*d+b*c)^5/g^3/i^3/(d*x+c)+4*b^3*d*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*
d+b*c)^5/g^3/i^3/(b*x+a)-1/2*b^4*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*
d+b*c)^5/g^3/i^3/(b*x+a)^2+6*b^2*d^2*ln((b*x+a)/(d*x+c))*(A+B*ln(e*(b*x+a)/
(d*x+c)))/(-a*d+b*c)^5/g^3/i^3
```

Rubi [A]
time = 0.21, antiderivative size = 463, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 45, 2372, 2338}

$$-\frac{b^4(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b^3d(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^3(a+bx)(bc-ad)^5}+\frac{6b^2d^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^3(bc-ad)^5}+\frac{d^4(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^3(c+dx)^2(bc-ad)^5}-\frac{4bd^3(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^3(c+dx)(bc-ad)^5}-\frac{b^4B(c+dx)^2}{4g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b^3Bd(c+dx)}{g^3i^3(a+bx)(bc-ad)^5}-\frac{3b^2Bd^2\log^2\left(\frac{a+bx}{c+dx}\right)}{g^3i^3(bc-ad)^5}-\frac{Bd^4(a+bx)^2}{4g^3i^3(c+dx)^2(bc-ad)^5}+\frac{4bBd^3(a+bx)}{g^3i^3(c+dx)(bc-ad)^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*x)^3),
x]
```

```
[Out] -1/4*(B*d^4*(a + b*x)^2)/((b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (4*b*B*d^3*(
a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*B*d*(c + d*x))/((b*c -
 a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B*(c + d*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(
a + b*x)^2) - (3*b^2*B*d^2*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^5*g^3*i
^3) + (d^4*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)
^5*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c +
d*x)]))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*d*(c + d*x)*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*(c + d*x
)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x
)^2) + (6*b^2*d^2*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/((b*c - a*d)^5*g^3*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(53c+53dx)^3(ag+bgx)^3}\,dx = \int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^3g^3(a+bx)^3} - \frac{3b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^4g^3(a+bx)^2} + \frac{6b^3}{148\cdots}\right.$$

$$= \frac{(6b^3d^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{148877(bc-ad)^5g^3} - \frac{(6b^2d^3)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{148877(bc-ad)^5g^3} - \frac{(3b^3d)\int \frac{A\cdots}{\cdots}}{148877\cdots}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A\cdots\right.}{297754\cdots}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A\cdots\right.}{297754\cdots}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A\cdots\right.}{297754\cdots}$$

$$= -\frac{b^2B}{595508(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd}{297754(bc-ad)^4g^3(a+bx)} - \frac{\cdots}{595508\cdots}$$

$$= -\frac{b^2B}{595508(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd}{297754(bc-ad)^4g^3(a+bx)} - \frac{\cdots}{595508\cdots}$$

$$= -\frac{b^2B}{595508(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd}{297754(bc-ad)^4g^3(a+bx)} - \frac{\cdots}{595508\cdots}$$

$$= -\frac{b^2B}{595508(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd}{297754(bc-ad)^4g^3(a+bx)} - \frac{\cdots}{595508\cdots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.76, size = 533, normalized size = 1.15

$$-\frac{\frac{b^2B(bc-ad)^2}{(a+bx)^2} - \frac{12b^3Bcd}{a+bx} + \frac{12ab^2Bd^2}{a+bx} - \frac{2b^2Bd(bc-ad)}{a+bx} + \frac{Bd^2(bc-ad)^2}{(c+dx)^2} + \frac{12b^2Bcd^2}{c+dx} - \frac{12abBd^3}{c+dx} + \frac{2bBd^2(bc-ad)}{c+dx} + \frac{2b^2(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)^2} - \frac{12b^2d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx} - \frac{2d^2(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(c+dx)^2} - \frac{12bd^2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx} - 24b^2d^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) + 24b^2d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx) + 12b^2Bd^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right) - 12b^2Bd^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right) - \log(c+dx)\right)\log(c+dx) + 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^5g^3i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*
x)^3),x]
```

```
[Out] -1/4*((b^2*B*(b*c - a*d)^2)/(a + b*x)^2 - (12*b^3*B*c*d)/(a + b*x) + (12*a*
b^2*B*d^2)/(a + b*x) - (2*b^2*B*d*(b*c - a*d))/(a + b*x) + (B*d^2*(b*c - a*
d)^2)/(c + d*x)^2 + (12*b^2*B*c*d^2)/(c + d*x) - (12*a*b*B*d^3)/(c + d*x) +
 (2*b*B*d^2*(b*c - a*d))/(c + d*x) + (2*b^2*(b*c - a*d)^2*(A + B*Log[(e*(a
```

```
+ b*x))/(c + d*x)]))/(a + b*x)^2 - (12*b^2*d*(b*c - a*d)*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]))/(a + b*x) - (2*d^2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(c + d*x)^2 - (12*b*d^2*(b*c - a*d)*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(c + d*x) - 24*b^2*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))
/(c + d*x)]) + 24*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x]
 + 12*b^2*B*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*
d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 12*b^2*B*d^2*((2*Log[(
d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b
*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^5*g^3*i^3)
```

Maple [A]
time = 0.81, size = 804, normalized size = 1.74 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/2*d^2*e/i^3/(a*d-b*c)^6/g^3*A*b^4/(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2+4*d^3/i^3/(a*d-b*c)^6/g^3*A*b^3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))
+6*d^4/e/i^3/(a*d-b*c)^6/g^3*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-4*d^5/e^
2/i^3/(a*d-b*c)^6/g^3*A*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/2*d^6/e^3/i^3/(a*
d-b*c)^6/g^3*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+d^2*e/i^3/(a*d-b*c)^6/g^3*B*
b^4*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1
/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-4*d^3/i^3/(a*d-b*c)^6/g^3*B*b^3*(-1/(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/(b*e/d+(a*d-b*
c)*e/d/(d*x+c)))+3*d^4/e/i^3/(a*d-b*c)^6/g^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))^2-4*d^5/e^2/i^3/(a*d-b*c)^6/g^3*B*b*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d)+d^6/e^3/i^3/(a
*d-b*c)^6/g^3*B*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))-1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2298 vs. 2(430) = 860.
time = 0.63, size = 2298, normalized size = 4.96

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] 1/2*B*(12*b^2*d^2*log(b*x + a)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^
3*c^3*d^2 + 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) - 12*b
^2*d^2*log(d*x + c)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 +
 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) + (12*b^3*d^3*x^3
 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^
```

```
2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((-I*b^6*c^4*d^2
+ 4*I*a*b^5*c^3*d^3 - 6*I*a^2*b^4*c^2*d^4 + 4*I*a^3*b^3*c*d^5 - I*a^4*b^2*d
^6)*g^3*x^4 + 2*(-I*b^6*c^5*d + 3*I*a*b^5*c^4*d^2 - 2*I*a^2*b^4*c^3*d^3 - 2
*I*a^3*b^3*c^2*d^4 + 3*I*a^4*b^2*c*d^5 - I*a^5*b*d^6)*g^3*x^3 + (-I*b^6*c^6
 + 9*I*a^2*b^4*c^4*d^2 - 16*I*a^3*b^3*c^3*d^3 + 9*I*a^4*b^2*c^2*d^4 - I*a^6
*d^6)*g^3*x^2 + 2*(-I*a*b^5*c^6 + 3*I*a^2*b^4*c^5*d - 2*I*a^3*b^3*c^4*d^2 -
 2*I*a^4*b^2*c^3*d^3 + 3*I*a^5*b*c^2*d^4 - I*a^6*c*d^5)*g^3*x + (-I*a^2*b^4
*c^6 + 4*I*a^3*b^3*c^5*d - 6*I*a^4*b^2*c^4*d^2 + 4*I*a^5*b*c^3*d^3 - I*a^6*
c^2*d^4)*g^3))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 1/2*A*(12*b^2*d^2*log
(b*x + a)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 + 10*I*a^3*
b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) - 12*b^2*d^2*log(d*x + c)/(
(-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 + 10*I*a^3*b^2*c^2*d^3
 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) + (12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*
c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c
^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((-I*b^6*c^4*d^2 + 4*I*a*b^5*c^3*d^3 -
 6*I*a^2*b^4*c^2*d^4 + 4*I*a^3*b^3*c*d^5 - I*a^4*b^2*d^6)*g^3*x^4 + 2*(-I*b
^6*c^5*d + 3*I*a*b^5*c^4*d^2 - 2*I*a^2*b^4*c^3*d^3 - 2*I*a^3*b^3*c^2*d^4 +
3*I*a^4*b^2*c*d^5 - I*a^5*b*d^6)*g^3*x^3 + (-I*b^6*c^6 + 9*I*a^2*b^4*c^4*d^
2 - 16*I*a^3*b^3*c^3*d^3 + 9*I*a^4*b^2*c^2*d^4 - I*a^6*d^6)*g^3*x^2 + 2*(-I
*a*b^5*c^6 + 3*I*a^2*b^4*c^5*d - 2*I*a^3*b^3*c^4*d^2 - 2*I*a^4*b^2*c^3*d^3
+ 3*I*a^5*b*c^2*d^4 - I*a^6*c*d^5)*g^3*x + (-I*a^2*b^4*c^6 + 4*I*a^3*b^3*c^
5*d - 6*I*a^4*b^2*c^4*d^2 + 4*I*a^5*b*c^3*d^3 - I*a^6*c^2*d^4)*g^3)) - 1/4*
(I*b^4*c^4 - 16*I*a*b^3*c^3*d + 30*I*a^2*b^2*c^2*d^2 - 16*I*a^3*b*c*d^3 + I
*a^4*d^4 - 12*(I*b^4*c^2*d^2 - 2*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)*x^2 - 12*(-
I*b^4*d^4*x^4 - I*a^2*b^2*c^2*d^2 + 2*(-I*b^4*c*d^3 - I*a*b^3*d^4)*x^3 + (-
I*b^4*c^2*d^2 - 4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 + 2*(-I*a*b^3*c^2*d^2
- I*a^2*b^2*c*d^3)*x)*log(b*x + a)^2 - 24*(I*b^4*d^4*x^4 + I*a^2*b^2*c^2*d^
2 + 2*(I*b^4*c*d^3 + I*a*b^3*d^4)*x^3 + (I*b^4*c^2*d^2 + 4*I*a*b^3*c*d^3 +
I*a^2*b^2*d^4)*x^2 + 2*(I*a*b^3*c^2*d^2 + I*a^2*b^2*c*d^3)*x)*log(b*x + a)*
log(d*x + c) - 12*(-I*b^4*d^4*x^4 - I*a^2*b^2*c^2*d^2 + 2*(-I*b^4*c*d^3 - I
*a*b^3*d^4)*x^3 + (-I*b^4*c^2*d^2 - 4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 +
2*(-I*a*b^3*c^2*d^2 - I*a^2*b^2*c*d^3)*x)*log(d*x + c)^2 - 12*(I*b^4*c^3*d
- I*a*b^3*c^2*d^2 - I*a^2*b^2*c*d^3 + I*a^3*b*d^4)*x)*B/(a^2*b^5*c^7*g^3 -
5*a^3*b^4*c^6*d*g^3 + 10*a^4*b^3*c^5*d^2*g^3 - 10*a^5*b^2*c^4*d^3*g^3 + 5*a
^6*b*c^3*d^4*g^3 - a^7*c^2*d^5*g^3 + (b^7*c^5*d^2*g^3 - 5*a*b^6*c^4*d^3*g^3
 + 10*a^2*b^5*c^3*d^4*g^3 - 10*a^3*b^4*c^2*d^5*g^3 + 5*a^4*b^3*c*d^6*g^3 -
a^5*b^2*d^7*g^3)*x^4 + 2*(b^7*c^6*d*g^3 - 4*a*b^6*c^5*d^2*g^3 + 5*a^2*b^5*c
^4*d^3*g^3 - 5*a^4*b^3*c^2*d^5*g^3 + 4*a^5*b^2*c*d^6*g^3 - a^6*b*d^7*g^3)*x
^3 + (b^7*c^7*g^3 - a*b^6*c^6*d*g^3 - 9*a^2*b^5*c^5*d^2*g^3 + 25*a^3*b^4*c^
4*d^3*g^3 - 25*a^4*b^3*c^3*d^4*g^3 + 9*a^5*b^2*c^2*d^5*g^3 + a^6*b*c*d^6*g^
3 - a^7*d^7*g^3)*x^2 + 2*(a*b^6*c^7*g^3 - 4*a^2*b^5*c^6*d*g^3 + 5*a^3*b^4*c
^5*d^2*g^3 - 5*a^5*b^2*c^3*d^4*g^3 + 4*a^6*b*c^2*d^5*g^3 - a^7*c*d^6*g^3)*x
)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than

twice the leaf count of optimal. 1022 vs. $2(430) = 860$.
time = 0.43, size = 1022, normalized size = 2.21

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] -1/4*((2*I*A + I*B)*b^4*c^4 - 16*(I*A + I*B)*a*b^3*c^3*d + 30*I*B*a^2*b^2*c
^2*d^2 - 16*(-I*A + I*B)*a^3*b*c*d^3 + (-2*I*A + I*B)*a^4*d^4 - 24*(I*A*b^4
*c*d^3 - I*A*a*b^3*d^4)*x^3 - 12*((3*I*A + I*B)*b^4*c^2*d^2 - 2*I*B*a*b^3*c
*d^3 + (-3*I*A + I*B)*a^2*b^2*d^4)*x^2 - 12*(I*B*b^4*d^4*x^4 + I*B*a^2*b^2*
c^2*d^2 + 2*(I*B*b^4*c*d^3 + I*B*a*b^3*d^4)*x^3 + (I*B*b^4*c^2*d^2 + 4*I*B*
a*b^3*c*d^3 + I*B*a^2*b^2*d^4)*x^2 + 2*(I*B*a*b^3*c^2*d^2 + I*B*a^2*b^2*c*d
^3)*x)*log((b*x + a)*e/(d*x + c))^2 - 4*((2*I*A + 3*I*B)*b^4*c^3*d + 3*(4*I
*A - I*B)*a*b^3*c^2*d^2 + 3*(-4*I*A - I*B)*a^2*b^2*c*d^3 + (-2*I*A + 3*I*B)
*a^3*b*d^4)*x - 2*(12*I*A*b^4*d^4*x^4 - I*B*b^4*c^4 + 8*I*B*a*b^3*c^3*d + 1
2*I*A*a^2*b^2*c^2*d^2 - 8*I*B*a^3*b*c*d^3 + I*B*a^4*d^4 + 12*((2*I*A + I*B)
*b^4*c*d^3 + (2*I*A - I*B)*a*b^3*d^4)*x^3 + 6*((2*I*A + 3*I*B)*b^4*c^2*d^2
+ 8*I*A*a*b^3*c*d^3 + (2*I*A - 3*I*B)*a^2*b^2*d^4)*x^2 + 4*(I*B*b^4*c^3*d +
 6*(I*A + I*B)*a*b^3*c^2*d^2 + 6*(I*A - I*B)*a^2*b^2*c*d^3 - I*B*a^3*b*d^4)
*x)*log((b*x + a)*e/(d*x + c)))/((b^7*c^5*d^2 - 5*a*b^6*c^4*d^3 + 10*a^2*b^
5*c^3*d^4 - 10*a^3*b^4*c^2*d^5 + 5*a^4*b^3*c*d^6 - a^5*b^2*d^7)*g^3*x^4 + 2
*(b^7*c^6*d - 4*a*b^6*c^5*d^2 + 5*a^2*b^5*c^4*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a
^5*b^2*c*d^6 - a^6*b*d^7)*g^3*x^3 + (b^7*c^7 - a*b^6*c^6*d - 9*a^2*b^5*c^5*
d^2 + 25*a^3*b^4*c^4*d^3 - 25*a^4*b^3*c^3*d^4 + 9*a^5*b^2*c^2*d^5 + a^6*b*c
*d^6 - a^7*d^7)*g^3*x^2 + 2*(a*b^6*c^7 - 4*a^2*b^5*c^6*d + 5*a^3*b^4*c^5*d^
2 - 5*a^5*b^2*c^3*d^4 + 4*a^6*b*c^2*d^5 - a^7*c*d^6)*g^3*x + (a^2*b^5*c^7 -
 5*a^3*b^4*c^6*d + 10*a^4*b^3*c^5*d^2 - 10*a^5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^
4 - a^7*c^2*d^5)*g^3)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 2106 vs. $2(430) = 860$.
time = 144.96, size = 2106, normalized size = 4.55

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3/(d*i*x+c*i)**3,x)
```

```
[Out] 6*A*b**2*d**2*log(x + (-6*A*a**6*b**2*d**8/(a*d - b*c)**5 + 36*A*a**5*b**3*
c*d**7/(a*d - b*c)**5 - 90*A*a**4*b**4*c**2*d**6/(a*d - b*c)**5 + 120*A*a**
3*b**5*c**3*d**5/(a*d - b*c)**5 - 90*A*a**2*b**6*c**4*d**4/(a*d - b*c)**5 +
 36*A*a*b**7*c**5*d**3/(a*d - b*c)**5 + 6*A*a*b**2*d**3 - 6*A*b**8*c**6*d**
```

```
2/(a*d - b*c)**5 + 6*A*b**3*c*d**2)/(12*A*b**3*d**3))/(g**3*i**3*(a*d - b*c
)**5) - 6*A*b**2*d**2*log(x + (6*A*a**6*b**2*d**8/(a*d - b*c)**5 - 36*A*a**
5*b**3*c*d**7/(a*d - b*c)**5 + 90*A*a**4*b**4*c**2*d**6/(a*d - b*c)**5 - 12
0*A*a**3*b**5*c**3*d**5/(a*d - b*c)**5 + 90*A*a**2*b**6*c**4*d**4/(a*d - b*
c)**5 - 36*A*a*b**7*c**5*d**3/(a*d - b*c)**5 + 6*A*a*b**2*d**3 + 6*A*b**8*c
**6*d**2/(a*d - b*c)**5 + 6*A*b**3*c*d**2)/(12*A*b**3*d**3))/(g**3*i**3*(a*
d - b*c)**5) - 3*B*b**2*d**2*log(e*(a + b*x)/(c + d*x))**2/(a**5*d**5*g**3*
i**3 - 5*a**4*b*c*d**4*g**3*i**3 + 10*a**3*b**2*c**2*d**3*g**3*i**3 - 10*a*
*2*b**3*c**3*d**2*g**3*i**3 + 5*a*b**4*c**4*d*g**3*i**3 - b**5*c**5*g**3*i*
*3) + (-B*a**3*d**3 + 7*B*a**2*b*c*d**2 + 4*B*a**2*b*d**3*x + 7*B*a*b**2*c*
*2*d + 28*B*a*b**2*c*d**2*x + 18*B*a*b**2*d**3*x**2 - B*b**3*c**3 + 4*B*b**
3*c**2*d*x + 18*B*b**3*c*d**2*x**2 + 12*B*b**3*d**3*x**3)*log(e*(a + b*x)/(
c + d*x))/(2*a**6*c**2*d**4*g**3*i**3 + 4*a**6*c*d**5*g**3*i**3*x + 2*a**6*
d**6*g**3*i**3*x**2 - 8*a**5*b*c**3*d**3*g**3*i**3 - 12*a**5*b*c**2*d**4*g*
*3*i**3*x + 4*a**5*b*d**6*g**3*i**3*x**3 + 12*a**4*b**2*c**4*d**2*g**3*i**3
 + 8*a**4*b**2*c**3*d**3*g**3*i**3*x - 18*a**4*b**2*c**2*d**4*g**3*i**3*x**
2 - 12*a**4*b**2*c*d**5*g**3*i**3*x**3 + 2*a**4*b**2*d**6*g**3*i**3*x**4 -
8*a**3*b**3*c**5*d*g**3*i**3 + 8*a**3*b**3*c**4*d**2*g**3*i**3*x + 32*a**3*
b**3*c**3*d**3*g**3*i**3*x**2 + 8*a**3*b**3*c**2*d**4*g**3*i**3*x**3 - 8*a*
*3*b**3*c*d**5*g**3*i**3*x**4 + 2*a**2*b**4*c**6*g**3*i**3 - 12*a**2*b**4*c
**5*d*g**3*i**3*x - 18*a**2*b**4*c**4*d**2*g**3*i**3*x**2 + 8*a**2*b**4*c**
3*d**3*g**3*i**3*x**3 + 12*a**2*b**4*c**2*d**4*g**3*i**3*x**4 + 4*a*b**5*c*
*6*g**3*i**3*x - 12*a*b**5*c**4*d**2*g**3*i**3*x**3 - 8*a*b**5*c**3*d**3*g*
*3*i**3*x**4 + 2*b**6*c**6*g**3*i**3*x**2 + 4*b**6*c**5*d*g**3*i**3*x**3 +
2*b**6*c**4*d**2*g**3*i**3*x**4) + (-2*A*a**3*d**3 + 14*A*a**2*b*c*d**2 + 1
4*A*a*b**2*c**2*d - 2*A*b**3*c**3 + 24*A*b**3*d**3*x**3 + B*a**3*d**3 - 15*
B*a**2*b*c*d**2 + 15*B*a*b**2*c**2*d - B*b**3*c**3 + x**2*(36*A*a*b**2*d**3
 + 36*A*b**3*c*d**2 - 12*B*a*b**2*d**3 + 12*B*b**3*c*d**2) + x*(8*A*a**2*b*
d**3 + 56*A*a*b**2*c*d**2 + 8*A*b**3*c**2*d - 12*B*a**2*b*d**3 + 12*B*b**3*
c**2*d))/(4*a**6*c**2*d**4*g**3*i**3 - 16*a**5*b*c**3*d**3*g**3*i**3 + 24*a
**4*b**2*c**4*d**2*g**3*i**3 - 16*a**3*b**3*c**5*d*g**3*i**3 + 4*a**2*b**4*
c**6*g**3*i**3 + x**4*(4*a**4*b**2*d**6*g**3*i**3 - 16*a**3*b**3*c*d**5*g**
3*i**3 + 24*a**2*b**4*c**2*d**4*g**3*i**3 - 16*a*b**5*c**3*d**3*g**3*i**3 +
 4*b**6*c**4*d**2*g**3*i**3) + x**3*(8*a**5*b*d**6*g**3*i**3 - 24*a**4*b**2
*c*d**5*g**3*i**3 + 16*a**3*b**3*c**2*d**4*g**3*i**3 + 16*a**2*b**4*c**3*d*
*3*g**3*i**3 - 24*a*b**5*c**4*d**2*g**3*i**3 + 8*b**6*c**5*d*g**3*i**3) + x
**2*(4*a**6*d**6*g**3*i**3 - 36*a**4*b**2*c**2*d**4*g**3*i**3 + 64*a**3*b**
3*c**3*d**3*g**3*i**3 - 36*a**2*b**4*c**4*d**2*g**3*i**3 + 4*b**6*c**6*g**3
*i**3) + x*(8*a**6*c*d**5*g**3*i**3 - 24*a**5*b*c**2*d**4*g**3*i**3 + 16*a*
*4*b**2*c**3*d**3*g**3*i**3 + 16*a**3*b**3*c**4*d**2*g**3*i**3 - 24*a**2*b*
*4*c**5*d*g**3*i**3 + 8*a*b**5*c**6*g**3*i**3))
```

Giac [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^3*(I*d*x + I*c)
^3), x)
```

Mupad [B]
time = 12.78, size = 1443, normalized size = 3.12

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/((a*g + b*g*x)^3*(c*i + d*i*x)^3),
x)
```

```
[Out] (A*b^2*d^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*12i)/(g^3*i^3*(a*
d - b*c)^5) - (3*B*b^2*d^2*log((e*(a + b*x))/(c + d*x))^2)/(g^3*i^3*(a*d -
b*c)^5) - (A*a^3*d^3)/(2*g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) - (
A*b^3*c^3)/(2*g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) + (B*a^3*d^3)/
(4*g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) - (B*b^3*c^3)/(4*g^3*i^3*
(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) - (B*a*d*log((e*(a + b*x))/(c + d*x)
))/(2*g^3*i^3*(a*d - b*c)^2*(a + b*x)^2*(c + d*x)^2) - (B*b*c*log((e*(a + b
*x))/(c + d*x)))/(2*g^3*i^3*(a*d - b*c)^2*(a + b*x)^2*(c + d*x)^2) + (6*A*b
^3*d^3*x^3)/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) + (7*A*a*b^2*c^
2*d)/(2*g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) + (7*A*a^2*b*c*d^2)/
(2*g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) + (15*B*a*b^2*c^2*d)/(4*g
^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) - (15*B*a^2*b*c*d^2)/(4*g^3*i
^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) + (2*A*a^2*b*d^3*x)/(g^3*i^3*(a*d
 - b*c)^4*(a + b*x)^2*(c + d*x)^2) - (3*B*a^2*b*d^3*x)/(g^3*i^3*(a*d - b*c)
^4*(a + b*x)^2*(c + d*x)^2) + (2*A*b^3*c^2*d*x)/(g^3*i^3*(a*d - b*c)^4*(a +
 b*x)^2*(c + d*x)^2) + (3*B*b^3*c^2*d*x)/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2
*(c + d*x)^2) + (9*A*a*b^2*d^3*x^2)/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c +
 d*x)^2) - (3*B*a*b^2*d^3*x^2)/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)
^2) + (9*A*b^3*c*d^2*x^2)/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) +
 (3*B*b^3*c*d^2*x^2)/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) - (B*b
*d*x*log((e*(a + b*x))/(c + d*x)))/(g^3*i^3*(a*d - b*c)^2*(a + b*x)^2*(c +
d*x)^2) + (6*B*b^3*d^3*x^3*log((e*(a + b*x))/(c + d*x)))/(g^3*i^3*(a*d - b*
c)^4*(a + b*x)^2*(c + d*x)^2) + (9*B*a*b^2*d^3*x^2*log((e*(a + b*x))/(c + d
*x)))/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) + (9*B*b^3*c*d^2*x^2*
log((e*(a + b*x))/(c + d*x)))/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^
2) + (14*A*a*b^2*c*d^2*x)/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) +
 (3*B*a*b^2*c^2*d*log((e*(a + b*x))/(c + d*x)))/(g^3*i^3*(a*d - b*c)^4*(a +
 b*x)^2*(c + d*x)^2) + (3*B*a^2*b*c*d^2*log((e*(a + b*x))/(c + d*x)))/(g^3*
i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) + (3*B*a^2*b*d^3*x*log((e*(a + b
```

```
*x))/(c + d*x)))/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(c + d*x)^2) + (3*B*b^3
*c^2*d*x*log((e*(a + b*x))/(c + d*x)))/(g^3*i^3*(a*d - b*c)^4*(a + b*x)^2*(
c + d*x)^2) + (12*B*a*b^2*c*d^2*x*log((e*(a + b*x))/(c + d*x)))/(g^3*i^3*(a
*d - b*c)^4*(a + b*x)^2*(c + d*x)^2)
```

3.54 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)^3}\,dx$

Optimal. Leaf size=563

$$\frac{Bd^5(a+bx)^2}{4(bc-ad)^6g^4i^3(c+dx)^2}-\frac{5bBd^4(a+bx)}{(bc-ad)^6g^4i^3(c+dx)}-\frac{10b^3Bd^2(c+dx)}{(bc-ad)^6g^4i^3(a+bx)}+\frac{5b^4Bd(c+dx)^2}{4(bc-ad)^6g^4i^3(a+bx)^2}-\frac{}{9(bc}$$

```
[Out] 1/4*B*d^5*(b*x+a)^2/(-a*d+b*c)^6/g^4/i^3/(d*x+c)^2-5*b*B*d^4*(b*x+a)/(-a*d+
b*c)^6/g^4/i^3/(d*x+c)-10*b^3*B*d^2*(d*x+c)/(-a*d+b*c)^6/g^4/i^3/(b*x+a)+5/
4*b^4*B*d*(d*x+c)^2/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^2-1/9*b^5*B*(d*x+c)^3/(-a*
d+b*c)^6/g^4/i^3/(b*x+a)^3+5*b^2*B*d^3*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^6/g
^4/i^3-1/2*d^5*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^6/g^4/i^3/(
d*x+c)^2+5*b*d^4*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^6/g^4/i^3/(
d*x+c)-10*b^3*d^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^6/g^4/i^3/
(b*x+a)+5/2*b^4*d*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^6/g^4/i^
3/(b*x+a)^2-1/3*b^5*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^6/g^4/
i^3/(b*x+a)^3-10*b^2*d^3*ln((b*x+a)/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-
a*d+b*c)^6/g^4/i^3
```

Rubi [A]
time = 0.26, antiderivative size = 563, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {2562, 45, 2372, 12, 14, 2338}

$$-\frac{b^5(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^4i^3(a+bx)^3(bc-ad)^6}+\frac{5b^4d(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^4i^3(a+bx)^2(bc-ad)^6}-\frac{10b^3d^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^3(a+bx)(bc-ad)^6}-\frac{10b^2d^3\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^3(bc-ad)^6}-\frac{d^5(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^4i^3(c+dx)^2(bc-ad)^6}+\frac{5bd^4(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^3(c+dx)(bc-ad)^6}-\frac{b^5B(c+dx)^3}{9g^4i^3(a+bx)^3(bc-ad)^6}+\frac{5b^4Bd(c+dx)^2}{4g^4i^3(a+bx)^2(bc-ad)^6}-\frac{10b^3Bd^2(c+dx)}{g^4i^3(a+bx)(bc-ad)^6}+\frac{5b^2Bd^3\log^2\left(\frac{a+bx}{c+dx}\right)}{g^4i^3(bc-ad)^6}+\frac{Bd^5(a+bx)^2}{4g^4i^3(c+dx)^2(bc-ad)^6}-\frac{5bBd^4(a+bx)}{g^4i^3(c+dx)(bc-ad)^6}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*x)^3),
x]
```

```
[Out] (B*d^5*(a + b*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (5*b*B*d^4*(a +
 b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*B*d^2*(c + d*x))/((b*c -
 a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*(c + d*x)^2)/(4*(b*c - a*d)^6*g^4*i
^3*(a + b*x)^2) - (b^5*B*(c + d*x)^3)/(9*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3)
 + (5*b^2*B*d^3*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3) - (d^5*
(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^6*g^4*i^3*
(c + d*x)^2) + (5*b*d^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b
*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*d^2*(c + d*x)*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*d*(c + d*x)^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2)
 - (b^5*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^6*
g^4*i^3*(a + b*x)^3) - (10*b^2*d^3*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/((b*c - a*d)^6*g^4*i^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(54c+54dx)^3(ag+bgx)^4}\,dx = \int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{157464(bc-ad)^3g^4(a+bx)^4} - \frac{b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{52488(bc-ad)^4g^4(a+bx)^3} + \frac{b^3d^2\left(\right.}{26244}\right.$$

$$= -\frac{(5b^3d^3)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{78732(bc-ad)^6g^4} + \frac{(5b^2d^4)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{78732(bc-ad)^6g^4} + \frac{(b^3d^2)\int \frac{A}{}}{26244(}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{472392(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{104976(bc-ad)^4g^4(a+bx)^2} - \frac{b^2d^2\left(A\right.}{26244(b}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{472392(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{104976(bc-ad)^4g^4(a+bx)^2} - \frac{b^2d^2\left(A\right.}{26244(b}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{472392(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{104976(bc-ad)^4g^4(a+bx)^2} - \frac{b^2d^2\left(A\right.}{26244(b}$$

$$= -\frac{b^2B}{1417176(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bd}{1889568(bc-ad)^4g^4(a+bx)^2} - \frac{}{94478}$$

$$= -\frac{b^2B}{1417176(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bd}{1889568(bc-ad)^4g^4(a+bx)^2} - \frac{}{94478}$$

$$= -\frac{b^2B}{1417176(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bd}{1889568(bc-ad)^4g^4(a+bx)^2} - \frac{}{94478}$$

$$= -\frac{b^2B}{1417176(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bd}{1889568(bc-ad)^4g^4(a+bx)^2} - \frac{}{94478}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 1.11, size = 637, normalized size = 1.13

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*
x)^3),x]
```

```
[Out] -1/36*((4*b^2*B*(b*c - a*d)^3)/(a + b*x)^3 - (33*b^2*B*d*(b*c - a*d)^2)/(a
+ b*x)^2 + (216*b^3*B*c*d^2)/(a + b*x) - (216*a*b^2*B*d^3)/(a + b*x) + (66*
b^2*B*d^2*(b*c - a*d))/(a + b*x) - (9*B*d^3*(b*c - a*d)^2)/(c + d*x)^2 - (1
44*b^2*B*c*d^3)/(c + d*x) + (144*a*b*B*d^4)/(c + d*x) - (18*b*B*d^3*(b*c -
```

```
a*d))/(c + d*x) + 120*b^2*B*d^3*Log[a + b*x] + (12*b^2*(b*c - a*d)^3*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^3 - (54*b^2*d*(b*c - a*d)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^2 + (216*b^2*d^2*(b*c - a*d)*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x) + (18*d^3*(b*c - a*d)^2*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x)^2 + (144*b*d^3*(b*c - a*d)*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) + 360*b^2*d^3*Log[a + b*x]*(A + B
*Log[(e*(a + b*x))/(c + d*x)]) - 120*b^2*B*d^3*Log[c + d*x] - 360*b^2*d^3*(
A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 180*b^2*B*d^3*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) + 180*b^2*B*d^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*
d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
)/((b*c - a*d)^6*g^4*i^3)
```

Maple [A]
time = 0.97, size = 981, normalized size = 1.74 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/3*d^2*e^2/i^3/(a*d-b*c)^7/g^4*A*b^5/(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^3-5/2*d^3*e/i^3/(a*d-b*c)^7/g^4*A*b^4/(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2+10*d^4/i^3/(a*d-b*c)^7/g^4*A*b^3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))+10*d
^5/e/i^3/(a*d-b*c)^7/g^4*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-5*d^6/e^2/i^
3/(a*d-b*c)^7/g^4*A*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/2*d^7/e^3/i^3/(a*d-b*
c)^7/g^4*A*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-d^2*e^2/i^3/(a*d-b*c)^7/g^4*B*b^
5*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/9
/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)+5*d^3*e/i^3/(a*d-b*c)^7/g^4*B*b^4*(-1/2/(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4/(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^2)-10*d^4/i^3/(a*d-b*c)^7/g^4*B*b^3*(-1/(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/(b*e/d+(a*d-b*c)*e/d/(d*
x+c)))+5*d^5/e/i^3/(a*d-b*c)^7/g^4*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-
5*d^6/e^2/i^3/(a*d-b*c)^7/g^4*B*b*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d)+d^7/e^3/i^3/(a*d-b*c)^7/
g^4*B*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3671 vs. 2(521) = 1042.
time = 1.11, size = 3671, normalized size = 6.52

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

[Out] 1/6*B*(60*b^2*d^3*log(b*x + a)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4
*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 +
I*a^6*d^6)*g^4) - 60*b^2*d^3*log(d*x + c)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 1
5*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5
*b*c*d^5 + I*a^6*d^6)*g^4) + (60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d +
47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^
3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(
b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((I*b^8*c
^5*d^2 - 5*I*a*b^7*c^4*d^3 + 10*I*a^2*b^6*c^3*d^4 - 10*I*a^3*b^5*c^2*d^5 +
5*I*a^4*b^4*c*d^6 - I*a^5*b^3*d^7)*g^4*x^5 + (2*I*b^8*c^6*d - 7*I*a*b^7*c^5
*d^2 + 5*I*a^2*b^6*c^4*d^3 + 10*I*a^3*b^5*c^3*d^4 - 20*I*a^4*b^4*c^2*d^5 +
13*I*a^5*b^3*c*d^6 - 3*I*a^6*b^2*d^7)*g^4*x^4 + (I*b^8*c^7 + I*a*b^7*c^6*d
- 17*I*a^2*b^6*c^5*d^2 + 35*I*a^3*b^5*c^4*d^3 - 25*I*a^4*b^4*c^3*d^4 - I*a^
5*b^3*c^2*d^5 + 9*I*a^6*b^2*c*d^6 - 3*I*a^7*b*d^7)*g^4*x^3 + (3*I*a*b^7*c^7
- 9*I*a^2*b^6*c^6*d + I*a^3*b^5*c^5*d^2 + 25*I*a^4*b^4*c^4*d^3 - 35*I*a^5*
b^3*c^3*d^4 + 17*I*a^6*b^2*c^2*d^5 - I*a^7*b*c*d^6 - I*a^8*d^7)*g^4*x^2 + (
3*I*a^2*b^6*c^7 - 13*I*a^3*b^5*c^6*d + 20*I*a^4*b^4*c^5*d^2 - 10*I*a^5*b^3*
c^4*d^3 - 5*I*a^6*b^2*c^3*d^4 + 7*I*a^7*b*c^2*d^5 - 2*I*a^8*c*d^6)*g^4*x +
(I*a^3*b^5*c^7 - 5*I*a^4*b^4*c^6*d + 10*I*a^5*b^3*c^5*d^2 - 10*I*a^6*b^2*c^
4*d^3 + 5*I*a^7*b*c^3*d^4 - I*a^8*c^2*d^5)*g^4))*log(b*x*e/(d*x + c) + a*e/
(d*x + c)) + 1/6*A*(60*b^2*d^3*log(b*x + a)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d +
15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a
^5*b*c*d^5 + I*a^6*d^6)*g^4) - 60*b^2*d^3*log(d*x + c)/((I*b^6*c^6 - 6*I*a*
b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*
d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) + (60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*
a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c
*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d
^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)
*x)/((I*b^8*c^5*d^2 - 5*I*a*b^7*c^4*d^3 + 10*I*a^2*b^6*c^3*d^4 - 10*I*a^3*b
^5*c^2*d^5 + 5*I*a^4*b^4*c*d^6 - I*a^5*b^3*d^7)*g^4*x^5 + (2*I*b^8*c^6*d -
7*I*a*b^7*c^5*d^2 + 5*I*a^2*b^6*c^4*d^3 + 10*I*a^3*b^5*c^3*d^4 - 20*I*a^4*b
^4*c^2*d^5 + 13*I*a^5*b^3*c*d^6 - 3*I*a^6*b^2*d^7)*g^4*x^4 + (I*b^8*c^7 + I
*a*b^7*c^6*d - 17*I*a^2*b^6*c^5*d^2 + 35*I*a^3*b^5*c^4*d^3 - 25*I*a^4*b^4*c
^3*d^4 - I*a^5*b^3*c^2*d^5 + 9*I*a^6*b^2*c*d^6 - 3*I*a^7*b*d^7)*g^4*x^3 + (
3*I*a*b^7*c^7 - 9*I*a^2*b^6*c^6*d + I*a^3*b^5*c^5*d^2 + 25*I*a^4*b^4*c^4*d^
3 - 35*I*a^5*b^3*c^3*d^4 + 17*I*a^6*b^2*c^2*d^5 - I*a^7*b*c*d^6 - I*a^8*d^7
)*g^4*x^2 + (3*I*a^2*b^6*c^7 - 13*I*a^3*b^5*c^6*d + 20*I*a^4*b^4*c^5*d^2 -
10*I*a^5*b^3*c^4*d^3 - 5*I*a^6*b^2*c^3*d^4 + 7*I*a^7*b*c^2*d^5 - 2*I*a^8*c*
d^6)*g^4*x + (I*a^3*b^5*c^7 - 5*I*a^4*b^4*c^6*d + 10*I*a^5*b^3*c^5*d^2 - 10
*I*a^6*b^2*c^4*d^3 + 5*I*a^7*b*c^3*d^4 - I*a^8*c^2*d^5)*g^4)) + 1/36*(-4*I*
b^5*c^5 + 45*I*a*b^4*c^4*d - 360*I*a^2*b^3*c^3*d^2 + 490*I*a^3*b^2*c^2*d^3
- 180*I*a^4*b*c*d^4 + 9*I*a^5*d^5 - 120*(I*b^5*c*d^4 - I*a*b^4*d^5)*x^4 - 1
20*(3*I*b^5*c^2*d^3 - 2*I*a*b^4*c*d^4 - I*a^2*b^3*d^5)*x^3 - 20*(11*I*b^5*c
^3*d^2 + 21*I*a*b^4*c^2*d^3 - 39*I*a^2*b^3*c*d^4 + 7*I*a^3*b^2*d^5)*x^2 - 1
80*(-I*b^5*d^5*x^5 - I*a^3*b^2*c^2*d^3 + (-2*I*b^5*c*d^4 - 3*I*a*b^4*d^5)*x

```
^4 + (-I*b^5*c^2*d^3 - 6*I*a*b^4*c*d^4 - 3*I*a^2*b^3*d^5)*x^3 + (-3*I*a*b^4
*c^2*d^3 - 6*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*x^2 + (-3*I*a^2*b^3*c^2*d^3 -
 2*I*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 - 180*(-I*b^5*d^5*x^5 - I*a^3*b^2*c^2
*d^3 + (-2*I*b^5*c*d^4 - 3*I*a*b^4*d^5)*x^4 + (-I*b^5*c^2*d^3 - 6*I*a*b^4*c
*d^4 - 3*I*a^2*b^3*d^5)*x^3 + (-3*I*a*b^4*c^2*d^3 - 6*I*a^2*b^3*c*d^4 - I*a
^3*b^2*d^5)*x^2 + (-3*I*a^2*b^3*c^2*d^3 - 2*I*a^3*b^2*c*d^4)*x)*log(d*x + c
)^2 - 5*(-5*I*b^5*c^4*d + 108*I*a*b^4*c^3*d^2 - 78*I*a^2*b^3*c^2*d^3 - 52*I
*a^3*b^2*c*d^4 + 27*I*a^4*b*d^5)*x - 120*(I*b^5*d^5*x^5 + I*a^3*b^2*c^2*d^3
 + (2*I*b^5*c*d^4 + 3*I*a*b^4*d^5)*x^4 + (I*b^5*c^2*d^3 + 6*I*a*b^4*c*d^4 +
 3*I*a^2*b^3*d^5)*x^3 + (3*I*a*b^4*c^2*d^3 + 6*I*a^2*b^3*c*d^4 + I*a^3*b^2*
d^5)*x^2 + (3*I*a^2*b^3*c^2*d^3 + 2*I*a^3*b^2*c*d^4)*x)*log(b*x + a) - 120*
(-I*b^5*d^5*x^5 - I*a^3*b^2*c^2*d^3 + (-2*I*b^5*c*d^4 - 3*I*a*b^4*d^5)*x^4
+ (-I*b^5*c^2*d^3 - 6*I*a*b^4*c*d^4 - 3*I*a^2*b^3*d^5)*x^3 + (-3*I*a*b^4*c^
2*d^3 - 6*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*x^2 + (-3*I*a^2*b^3*c^2*d^3 - 2*
I*a^3*b^2*c*d^4)*x + 3*(I*b^5*d^5*x^5 + I*a^3*b^2*c^2*d^3 + (2*I*b^5*c*d^4
+ 3*I*a*b^4*d^5)*x^4 + (I*b^5*c^2*d^3 + 6*I*a*b^4*c*d^4 + 3*I*a^2*b^3*d^5)*
x^3 + (3*I*a*b^4*c^2*d^3 + 6*I*a^2*b^3*c*d^4 + I*a^3*b^2*d^5)*x^2 + (3*I*a^
2*b^3*c^2*d^3 + 2*I*a^3*b^2*c*d^4)*x)*log(b*x + a))*log(d*x + c))*B/(a^3*b^
6*c^8*g^4 - 6*a^4*b^5*c^7*d*g^4 + 15*a^5*b^4*c^6*d^2*g^4 - 20*a^6*b^3*c^5*d
^3*g^4 + 15*a^7*b^2*c^4*d^4*g^4 - 6*a^8*b*c^3*d^5*g^4 + a^9*c^2*d^6*g^4 + (
b^9*c^6*d^2*g^4 - 6*a*b^8*c^5*d^3*g^4 + 15*a^2*b^7*c^4*d^4*g^4 - 20*a^3*b^6
*c^3*d^5*g^4 + 15*a^4*b^5*c^2*d^6*g^4 - 6*a^5*b...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1517 vs. $2(521) = 1042$.
time = 0.44, size = 1517, normalized size = 2.69

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] -1/36*(4*(3*I*A + I*B)*b^5*c^5 + 45*(-2*I*A - I*B)*a*b^4*c^4*d + 360*(I*A +
 I*B)*a^2*b^3*c^3*d^2 + 10*(-12*I*A - 49*I*B)*a^3*b^2*c^2*d^3 + 180*(-I*A +
 I*B)*a^4*b*c*d^4 + 9*(2*I*A - I*B)*a^5*d^5 + 120*((3*I*A + I*B)*b^5*c*d^4
+ (-3*I*A - I*B)*a*b^4*d^5)*x^4 + 60*(3*(3*I*A + 2*I*B)*b^5*c^2*d^3 + 2*(3*
I*A - 2*I*B)*a*b^4*c*d^4 + (-15*I*A - 2*I*B)*a^2*b^3*d^5)*x^3 + 20*((6*I*A
+ 11*I*B)*b^5*c^3*d^2 + 21*(3*I*A + I*B)*a*b^4*c^2*d^3 + 3*(-12*I*A - 13*I*
B)*a^2*b^3*c*d^4 + (-33*I*A + 7*I*B)*a^3*b^2*d^5)*x^2 + 180*(I*B*b^5*d^5*x^
5 + I*B*a^3*b^2*c^2*d^3 + (2*I*B*b^5*c*d^4 + 3*I*B*a*b^4*d^5)*x^4 + (I*B*b^
5*c^2*d^3 + 6*I*B*a*b^4*c*d^4 + 3*I*B*a^2*b^3*d^5)*x^3 + (3*I*B*a*b^4*c^2*d
^3 + 6*I*B*a^2*b^3*c*d^4 + I*B*a^3*b^2*d^5)*x^2 + (3*I*B*a^2*b^3*c^2*d^3 +
2*I*B*a^3*b^2*c*d^4)*x)*log((b*x + a)*e/(d*x + c))^2 + 5*((-6*I*A - 5*I*B)*
b^5*c^4*d + 36*(2*I*A + 3*I*B)*a*b^4*c^3*d^2 + 6*(24*I*A - 13*I*B)*a^2*b^3*
```

```
c^2*d^3 + 4*(-48*I*A - 13*I*B)*a^3*b^2*c*d^4 + 9*(-2*I*A + 3*I*B)*a^4*b*d^5
)*x + 6*(20*(3*I*A + I*B)*b^5*d^5*x^5 + 2*I*B*b^5*c^5 - 15*I*B*a*b^4*c^4*d
+ 60*I*B*a^2*b^3*c^3*d^2 + 60*I*A*a^3*b^2*c^2*d^3 - 30*I*B*a^4*b*c*d^4 + 3*
I*B*a^5*d^5 + 20*((6*I*A + 5*I*B)*b^5*c*d^4 + 9*I*A*a*b^4*d^5)*x^4 + 10*((6
*I*A + 11*I*B)*b^5*c^2*d^3 + 18*(2*I*A + I*B)*a*b^4*c*d^4 + 9*(2*I*A - I*B)
*a^2*b^3*d^5)*x^3 + 10*(2*I*B*b^5*c^3*d^2 + 9*(2*I*A + 3*I*B)*a*b^4*c^2*d^3
 + 36*I*A*a^2*b^3*c*d^4 + 3*(2*I*A - 3*I*B)*a^3*b^2*d^5)*x^2 + 5*(-I*B*b^5*
c^4*d + 12*I*B*a*b^4*c^3*d^2 + 36*(I*A + I*B)*a^2*b^3*c^2*d^3 + 24*(I*A - I
*B)*a^3*b^2*c*d^4 - 3*I*B*a^4*b*d^5)*x)*log((b*x + a)*e/(d*x + c)))/((b^9*c
^6*d^2 - 6*a*b^8*c^5*d^3 + 15*a^2*b^7*c^4*d^4 - 20*a^3*b^6*c^3*d^5 + 15*a^4
*b^5*c^2*d^6 - 6*a^5*b^4*c*d^7 + a^6*b^3*d^8)*g^4*x^5 + (2*b^9*c^7*d - 9*a*
b^8*c^6*d^2 + 12*a^2*b^7*c^5*d^3 + 5*a^3*b^6*c^4*d^4 - 30*a^4*b^5*c^3*d^5 +
 33*a^5*b^4*c^2*d^6 - 16*a^6*b^3*c*d^7 + 3*a^7*b^2*d^8)*g^4*x^4 + (b^9*c^8
- 18*a^2*b^7*c^6*d^2 + 52*a^3*b^6*c^5*d^3 - 60*a^4*b^5*c^4*d^4 + 24*a^5*b^4
*c^3*d^5 + 10*a^6*b^3*c^2*d^6 - 12*a^7*b^2*c*d^7 + 3*a^8*b*d^8)*g^4*x^3 + (
3*a*b^8*c^8 - 12*a^2*b^7*c^7*d + 10*a^3*b^6*c^6*d^2 + 24*a^4*b^5*c^5*d^3 -
60*a^5*b^4*c^4*d^4 + 52*a^6*b^3*c^3*d^5 - 18*a^7*b^2*c^2*d^6 + a^9*d^8)*g^4
*x^2 + (3*a^2*b^7*c^8 - 16*a^3*b^6*c^7*d + 33*a^4*b^5*c^6*d^2 - 30*a^5*b^4*
c^5*d^3 + 5*a^6*b^3*c^4*d^4 + 12*a^7*b^2*c^3*d^5 - 9*a^8*b*c^2*d^6 + 2*a^9*
c*d^7)*g^4*x + (a^3*b^6*c^8 - 6*a^4*b^5*c^7*d + 15*a^5*b^4*c^6*d^2 - 20*a^6
*b^3*c^5*d^3 + 15*a^7*b^2*c^4*d^4 - 6*a^8*b*c^3*d^5 + a^9*c^2*d^6)*g^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^4*(I*d*x + I*c)
^3), x)
```

Mupad [**B**]
time = 16.59, size = 2291, normalized size = 4.07

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/((a*g + b*g*x)^4*(c*i + d*i*x)^3),
x)
```

```
[Out] ((12*A*b^4*c^4 - 18*A*a^4*d^4 + 9*B*a^4*d^4 + 4*B*b^4*c^4 + 282*A*a^2*b^2*c
^2*d^2 + 319*B*a^2*b^2*c^2*d^2 - 78*A*a*b^3*c^3*d + 162*A*a^3*b*c*d^3 - 41*
B*a*b^3*c^3*d - 171*B*a^3*b*c*d^3)/(6*(a*d - b*c)) + (10*x^2*(33*A*a^2*b^2*
d^4 - 7*B*a^2*b^2*d^4 + 6*A*b^4*c^2*d^2 + 11*B*b^4*c^2*d^2 + 69*A*a*b^3*c*d
^3 + 32*B*a*b^3*c*d^3))/(3*(a*d - b*c)) + (5*x*(18*A*a^3*b*d^4 - 27*B*a^3*b
*d^4 - 6*A*b^4*c^3*d - 5*B*b^4*c^3*d + 66*A*a*b^3*c^2*d^2 + 210*A*a^2*b^2*c
*d^3 + 103*B*a*b^3*c^2*d^2 + 25*B*a^2*b^2*c*d^3))/(6*(a*d - b*c)) + (10*x^3
*(15*A*a*b^3*d^4 + 2*B*a*b^3*d^4 + 9*A*b^4*c*d^3 + 6*B*b^4*c*d^3))/(a*d - b
*c) + (20*x^4*(3*A*b^4*d^4 + B*b^4*d^4))/(a*d - b*c))/(x^5*(6*a^4*b^3*d^6*g
^4*i^3 + 6*b^7*c^4*d^2*g^4*i^3 - 24*a*b^6*c^3*d^3*g^4*i^3 - 24*a^3*b^4*c*d^
5*g^4*i^3 + 36*a^2*b^5*c^2*d^4*g^4*i^3) + x*(18*a^2*b^5*c^6*g^4*i^3 + 12*a^
7*c*d^5*g^4*i^3 - 60*a^3*b^4*c^5*d*g^4*i^3 - 30*a^6*b*c^2*d^4*g^4*i^3 + 60*
a^4*b^3*c^4*d^2*g^4*i^3) + x^2*(6*a^7*d^6*g^4*i^3 + 18*a*b^6*c^6*g^4*i^3 +
12*a^6*b*c*d^5*g^4*i^3 - 36*a^2*b^5*c^5*d*g^4*i^3 - 30*a^3*b^4*c^4*d^2*g^4*
i^3 + 120*a^4*b^3*c^3*d^3*g^4*i^3 - 90*a^5*b^2*c^2*d^4*g^4*i^3) + x^3*(6*b^
7*c^6*g^4*i^3 + 18*a^6*b*d^6*g^4*i^3 + 12*a*b^6*c^5*d*g^4*i^3 - 36*a^5*b^2*
c*d^5*g^4*i^3 - 90*a^2*b^5*c^4*d^2*g^4*i^3 + 120*a^3*b^4*c^3*d^3*g^4*i^3 -
30*a^4*b^3*c^2*d^4*g^4*i^3) + x^4*(18*a^5*b^2*d^6*g^4*i^3 + 12*b^7*c^5*d*g^
4*i^3 - 30*a*b^6*c^4*d^2*g^4*i^3 - 60*a^4*b^3*c*d^5*g^4*i^3 + 60*a^3*b^4*c^
2*d^4*g^4*i^3) + 6*a^3*b^4*c^6*g^4*i^3 + 6*a^7*c^2*d^4*g^4*i^3 - 24*a^4*b^3
*c^5*d*g^4*i^3 - 24*a^6*b*c^3*d^3*g^4*i^3 + 36*a^5*b^2*c^4*d^2*g^4*i^3) + (
log((e*(a + b*x))/(c + d*x))*(x^2*((5*B*b*d*(a*d + b*c))/(g^4*i^3*(a^2*d^2
+ b^2*c^2 - 2*a*b*c*d)^2) + (5*B*b*d*(2*a*d + b*c))/(3*g^4*i^3*(a^2*d^2 + b
^2*c^2 - 2*a*b*c*d)^2) + (10*B*b^2*d^3*((2*a*c*(a*d - b*c))/d + ((a*d + b*c
)^2*(a*d - b*c))/(b*d^2)))/(g^4*i^3*(a*d - b*c)^4*(a^2*d^2 + b^2*c^2 - 2*a*
b*c*d))) + x^3*((5*B*b^2*d^2)/(g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) +
 (20*B*b^2*d^2*(a*d + b*c))/(g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a
*b*c*d))) + x*((5*B*(a*d + b*c)*(2*a*d + b*c))/(3*g^4*i^3*(a^2*d^2 + b^2*c^
2 - 2*a*b*c*d)^2) - (5*B)/(6*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (5*
B*a*b*c*d)/(g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (20*B*a*b*c*d*(a*d
 + b*c))/(g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - (B*(3*a
*d + 2*b*c))/(6*g^4*i^3*(a^2*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) + (5*B*a*c
*(2*a*d + b*c))/(3*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (10*B*b^3*d
^3*x^4)/(g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (10*B*a^2
*b*c^2*d)/(g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))))/(b^2*d*
x^5 + (x^4*(3*a*b^2*d^2 + 2*b^3*c*d))/(b*d) + (a^3*c^2)/(b*d) + (x^2*(a^3*d
^2 + 3*a*b^2*c^2 + 6*a^2*b*c*d))/(b*d) + (x^3*(b^3*c^2 + 3*a^2*b*d^2 + 6*a*
b^2*c*d))/(b*d) + (x*(3*a^2*b*c^2 + 2*a^3*c*d))/(b*d)) + (b^2*d^3*atan((b^2
*d^3*(3*A + B)*((a^6*d^6*g^4*i^3 - b^6*c^6*g^4*i^3 + 4*a*b^5*c^5*d*g^4*i^3
- 4*a^5*b*c*d^5*g^4*i^3 - 5*a^2*b^4*c^4*d^2*g^4*i^3 + 5*a^4*b^2*c^2*d^4*g^4
```

```
*i^3)/(a^5*d^5*g^4*i^3 - b^5*c^5*g^4*i^3 + 5*a*b^4*c^4*d*g^4*i^3 - 5*a^4*b*
c*d^4*g^4*i^3 - 10*a^2*b^3*c^3*d^2*g^4*i^3 + 10*a^3*b^2*c^2*d^3*g^4*i^3) +
2*b*d*x)*(a^5*d^5*g^4*i^3 - b^5*c^5*g^4*i^3 + 5*a*b^4*c^4*d*g^4*i^3 - 5*a^4
*b*c*d^4*g^4*i^3 - 10*a^2*b^3*c^3*d^2*g^4*i^3 + 10*a^3*b^2*c^2*d^3*g^4*i^3)
*10i)/(g^4*i^3*(a*d - b*c)^6*(30*A*b^2*d^3 + 10*B*b^2*d^3)))*(3*A + B)*20i)
/(3*g^4*i^3*(a*d - b*c)^6) - (5*B*b^2*d^3*log((e*(a + b*x))/(c + d*x))^2)/(
g^4*i^3*(a*d - b*c)^4*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))
```

3.55 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=539

$$\frac{3B^2(bc-ad)^4g^3ix}{10bd^3}-\frac{3B^2(bc-ad)^3g^3i(c+dx)^2}{20d^4}+\frac{bB^2(bc-ad)^2g^3i(c+dx)^3}{30d^4}-\frac{B(bc-ad)^2g^3i(a+bx)^3\left(A\right.}{30b^2d}$$

```
[Out] 3/10*B^2*(-a*d+b*c)^4*g^3*i*x/b/d^3-3/20*B^2*(-a*d+b*c)^3*g^3*i*(d*x+c)^2/d
^4+1/30*b*B^2*(-a*d+b*c)^2*g^3*i*(d*x+c)^3/d^4-1/30*B*(-a*d+b*c)^2*g^3*i*(b
*x+a)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2/d-1/10*B*(-a*d+b*c)*g^3*i*(b*x+a)^4
*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2+1/20*(-a*d+b*c)*g^3*i*(b*x+a)^4*(A+B*ln(e*
(b*x+a)/(d*x+c)))^2/b^2+1/5*g^3*i*(b*x+a)^4*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+
c)))^2/b+1/60*B*(-a*d+b*c)^3*g^3*i*(b*x+a)^2*(3*A+B+3*B*ln(e*(b*x+a)/(d*x+c
)))/b^2/d^2-1/60*B*(-a*d+b*c)^4*g^3*i*(b*x+a)*(6*A+5*B+6*B*ln(e*(b*x+a)/(d*
x+c)))/b^2/d^3-1/60*B*(-a*d+b*c)^5*g^3*i*ln((-a*d+b*c)/b/(d*x+c))*(6*A+11*B
+6*B*ln(e*(b*x+a)/(d*x+c)))/b^2/d^4-1/10*B^2*(-a*d+b*c)^5*g^3*i*ln(d*x+c)/b
^2/d^4-1/10*B^2*(-a*d+b*c)^5*g^3*i*polylog(2,d*(b*x+a)/b/(d*x+c))/b^2/d^4
```

Rubi [A]
time = 0.46, antiderivative size = 539, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2562, 2383, 2381, 2384, 2354, 2438, 2373, 45}

$$-\frac{B^2g^3i(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{10b^2d^4}-\frac{Bg^3i(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+11B\right)}{60b^2d^4}-\frac{Bg^3i(a+bx)(bc-ad)^4\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+5B\right)}{60b^2d^3}+\frac{Bg^3i(a+bx)^2(bc-ad)^3\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right)+3A+B\right)}{60b^2d^2}-\frac{Bg^3i(a+bx)^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{30b^2d}+\frac{g^3i(a+bx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{20b^2}-\frac{Bg^3i(a+bx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{10b^2}+\frac{g^3i(a+bx)^4(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{5b}-\frac{B^2g^3i(bc-ad)^5\log(c+dx)}{10b^2d^4}-\frac{3B^2g^3i(c+dx)^2(bc-ad)^3}{20d^4}+\frac{bB^2g^3i(c+dx)^3(bc-ad)^2}{30d^4}+\frac{3B^2g^3ix(bc-ad)^4}{10bd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (3*B^2*(b*c - a*d)^4*g^3*i*x)/(10*b*d^3) - (3*B^2*(b*c - a*d)^3*g^3*i*(c +
d*x)^2)/(20*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i*(c + d*x)^3)/(30*d^4) - (B*(b
*c - a*d)^2*g^3*i*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^2
*d) - (B*(b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(10*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2)/(20*b^2) + (g^3*i*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(
c + d*x)])^2)/(5*b) + (B*(b*c - a*d)^3*g^3*i*(a + b*x)^2*(3*A + B + 3*B*Log
[(e*(a + b*x))/(c + d*x)]))/(60*b^2*d^2) - (B*(b*c - a*d)^4*g^3*i*(a + b*x)
*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^2*d^3) - (B*(b*c - a
*d)^5*g^3*i*Log[(b*c - a*d)/(b*(c + d*x))]*(6*A + 11*B + 6*B*Log[(e*(a + b*
x))/(c + d*x)]))/(60*b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*Log[c + d*x])/(10*
b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]
)/(10*b^2*d^4)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (55c+55dx)(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx=\int\left(\frac{55(bc-ad)(ag+bgx)^3\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b}\right.$$

$$=\frac{(55(bc-ad))\int(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b}$$

$$=\frac{55(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2}$$

$$=\frac{55(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2}$$

$$=\frac{55(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2}$$

$$=\frac{55(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B(bc-ad)^3g^3(a+}{}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}-\frac{11B^2(bc-ad)^4g^3(a-}{2b^2d}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}-\frac{11B^2(bc-ad)^4g^3(a-}{2b^2d}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B^2(bc-ad)^4g^3x}{12bd^3}-$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B^2(bc-ad)^4g^3x}{12bd^3}-$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B^2(bc-ad)^4g^3x}{12bd^3}-$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B^2(bc-ad)^4g^3x}{12bd^3}-$$

Mathematica [A]
time = 0.51, size = 905, normalized size = 1.68

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2,x]
```

```
[Out] (g^3*i*(5*(b*c - a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
4*d*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (5*B*(b*c - a*d)^2
*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))
/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*
c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2
*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Lo
g[c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4
) + (B*(b*c - a*d)*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*
x)*Log[(e*(a + b*x))/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*L
og[(e*(a + b*x))/(c + d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*
(a + b*x))/(c + d*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*
x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[(e*(a
+ b*x))/(c + d*x)])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x -
 d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*(b*
c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*
c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Log[c
 + d*x]) + 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
 + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4))
)/(20*b^2)
```

Maple [F]
time = 0.41, size = 0, normalized size = 0.00

$$\int (bgx+ag)^3 (dix+ci) \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2682 vs. 2(509) = 1018.
time = 0.43, size = 2682, normalized size = 4.98

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="maxima")
```

```
[Out] 1/5*I*A^2*b^3*d*g^3*x^5 + 1/4*I*A^2*b^3*c*g^3*x^4 + 3/4*I*A^2*a*b^2*d*g^3*x
^4 + I*A^2*a*b^2*c*g^3*x^3 + I*A^2*a^2*b*d*g^3*x^3 + 3/2*I*A^2*a^2*b*c*g^3*
x^2 + 1/2*I*A^2*a^3*d*g^3*x^2 + 2*I*(x*log(b*x*e/(d*x + c) + a*e/(d*x + c))
 + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a^3*c*g^3 + 3*I*(x^2*log(b*x*e/
(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 -
(b*c - a*d)*x/(b*d))*A*B*a^2*b*c*g^3 + I*(2*x^3*log(b*x*e/(d*x + c) + a*e/(
d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a
*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b^2*c*g^3 + 1/12*I*
(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^
4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*
d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*c*g^3 + I*(x^2*log(b
*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d
^2 - (b*c - a*d)*x/(b*d))*A*B*a^3*d*g^3 + I*(2*x^3*log(b*x*e/(d*x + c) + a*
e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d
- a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b*d*g^3 + 1/4*
I*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*
c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*
b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^2*d*g^3 + 1/30*I*(
12*x^5*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*
c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^
2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/
(b^4*d^4))*A*B*b^3*d*g^3 + I*A^2*a^3*c*g^3*x - 1/60*(-11*I*b^4*c^5*g^3 + 49
*I*a*b^3*c^4*d*g^3 - 83*I*a^2*b^2*c^3*d^2*g^3 + 63*I*a^3*b*c^2*d^3*g^3 + 6*
I*a^4*c*d^4*g^3)*B^2*log(d*x + c)/(b*d^4) - 1/10*(-I*b^5*c^5*g^3 + 5*I*a*b^
4*c^4*d*g^3 - 10*I*a^2*b^3*c^3*d^2*g^3 + 10*I*a^3*b^2*c^2*d^3*g^3 - 5*I*a^4
*b*c*d^4*g^3 + I*a^5*d^5*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) +
 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^4) + 1/60*(12*I*B^2*b^5
*d^5*g^3*x^5 - 3*(-3*I*b^5*c*d^4*g^3 - 17*I*a*b^4*d^5*g^3)*B^2*x^4 - 12*(-3
*I*a*b^4*c*d^4*g^3 - 7*I*a^2*b^3*d^5*g^3)*B^2*x^3 + (I*b^5*c^3*d^2*g^3 - 3*
I*a*b^4*c^2*d^3*g^3 + 57*I*a^2*b^3*c*d^4*g^3 + 65*I*a^3*b^2*d^5*g^3)*B^2*x^
2 + (-5*I*b^5*c^4*d*g^3 + 22*I*a*b^4*c^3*d^2*g^3 - 36*I*a^2*b^3*c^2*d^3*g^3
 + 62*I*a^3*b^2*c*d^4*g^3 + 17*I*a^4*b*d^5*g^3)*B^2*x - 3*(-4*I*B^2*b^5*d^5
*g^3*x^5 - 20*I*B^2*a^3*b^2*c*d^4*g^3*x + 5*(-I*b^5*c*d^4*g^3 - 3*I*a*b^4*d
^5*g^3)*B^2*x^4 + 20*(-I*a*b^4*c*d^4*g^3 - I*a^2*b^3*d^5*g^3)*B^2*x^3 + 10*
(-3*I*a^2*b^3*c*d^4*g^3 - I*a^3*b^2*d^5*g^3)*B^2*x^2 + (-5*I*a^4*b*c*d^4*g^
3 + I*a^5*d^5*g^3)*B^2)*log(b*x + a)^2 - 3*(-4*I*B^2*b^5*d^5*g^3*x^5 - 20*I
*B^2*a^3*b^2*c*d^4*g^3*x + 5*(-I*b^5*c*d^4*g^3 - 3*I*a*b^4*d^5*g^3)*B^2*x^4
 + 20*(-I*a*b^4*c*d^4*g^3 - I*a^2*b^3*d^5*g^3)*B^2*x^3 + 10*(-3*I*a^2*b^3*c
*d^4*g^3 - I*a^3*b^2*d^5*g^3)*B^2*x^2 + (I*b^5*c^5*g^3 - 5*I*a*b^4*c^4*d*g^
3 + 10*I*a^2*b^3*c^3*d^2*g^3 - 10*I*a^3*b^2*c^2*d^3*g^3)*B^2)*log(d*x + c)^
2 + (24*I*B^2*b^5*d^5*g^3*x^5 - 24*(-I*b^5*c*d^4*g^3 - 4*I*a*b^4*d^5*g^3)*B
^2*x^4 - 2*(I*b^5*c^2*d^3*g^3 - 50*I*a*b^4*c*d^4*g^3 - 71*I*a^2*b^3*d^5*g^3
```

```
)*B^2*x^3 - 3*(-I*b^5*c^3*d^2*g^3 + 5*I*a*b^4*c^2*d^3*g^3 - 55*I*a^2*b^3*c*
d^4*g^3 - 29*I*a^3*b^2*d^5*g^3)*B^2*x^2 - 6*(I*b^5*c^4*d*g^3 - 5*I*a*b^4*c^
3*d^2*g^3 + 10*I*a^2*b^3*c^2*d^3*g^3 - 25*I*a^3*b^2*c*d^4*g^3 - I*a^4*b*d^5
*g^3)*B^2*x + (-6*I*a*b^4*c^4*d*g^3 + 27*I*a^2*b^3*c^3*d^2*g^3 - 47*I*a^3*b
^2*c^2*d^3*g^3 + 61*I*a^4*b*c*d^4*g^3 - 11*I*a^5*d^5*g^3)*B^2)*log(b*x + a)
 + (-24*I*B^2*b^5*d^5*g^3*x^5 - 24*(I*b^5*c*d^4*g^3 + 4*I*a*b^4*d^5*g^3)*B^
2*x^4 - 2*(-I*b^5*c^2*d^3*g^3 + 50*I*a*b^4*c*d^4*g^3 + 71*I*a^2*b^3*d^5*g^3
)*B^2*x^3 - 3*(I*b^5*c^3*d^2*g^3 - 5*I*a*b^4*c^2*d^3*g^3 + 55*I*a^2*b^3*c*d
^4*g^3 + 29*I*a^3*b^2*d^5*g^3)*B^2*x^2 - 6*(-I*b^5*c^4*d*g^3 + 5*I*a*b^4*c^
3*d^2*g^3 - 10*I*a^2*b^3*c^2*d^3*g^3 + 25*I*a^3*b^2*c*d^4*g^3 + I*a^4*b*d^5
*g^3)*B^2*x - 6*(4*I*B^2*b^5*d^5*g^3*x^5 + 20*I*B^2*a^3*b^2*c*d^4*g^3*x + 5
*(I*b^5*c*d^4*g^3 + 3*I*a*b^4*d^5*g^3)*B^2*x^4 + 20*(I*a*b^4*c*d^4*g^3 + I*
a^2*b^3*d^5*g^3)*B^2*x^3 + 10*(3*I*a^2*b^3*c*d^4*g^3 + I*a^3*b^2*d^5*g^3)*B
^2*x^2 + (5*I*a^4*b*c*d^4*g^3 - I*a^5*d^5*g^3)*B^2)*log(b*x + a))*log(d*x +
 c))/(b^2*d^4)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="fricas")
```

```
[Out] 1/20*(4*I*B^2*b^3*d*g^3*x^5 + 20*I*B^2*a^3*c*g^3*x - 5*(-I*B^2*b^3*c - 3*I*
B^2*a*b^2*d)*g^3*x^4 - 20*(-I*B^2*a*b^2*c - I*B^2*a^2*b*d)*g^3*x^3 - 10*(-3
*I*B^2*a^2*b*c - I*B^2*a^3*d)*g^3*x^2)*log((b*x + a)*e/(d*x + c))^2 + integ
ral(1/10*(10*I*A^2*b^4*d^2*g^3*x^6 + 10*I*A^2*a^4*c^2*g^3 - 20*(-I*A^2*b^4*
c*d - 2*I*A^2*a*b^3*d^2)*g^3*x^5 - 10*(-I*A^2*b^4*c^2 - 8*I*A^2*a*b^3*c*d -
 6*I*A^2*a^2*b^2*d^2)*g^3*x^4 - 40*(-I*A^2*a*b^3*c^2 - 3*I*A^2*a^2*b^2*c*d
- I*A^2*a^3*b*d^2)*g^3*x^3 - 10*(-6*I*A^2*a^2*b^2*c^2 - 8*I*A^2*a^3*b*c*d -
 I*A^2*a^4*d^2)*g^3*x^2 - 20*(-2*I*A^2*a^3*b*c^2 - I*A^2*a^4*c*d)*g^3*x + (
20*I*A*B*b^4*d^2*g^3*x^6 + 20*I*A*B*a^4*c^2*g^3 - 4*((-10*I*A*B + I*B^2)*b^
4*c*d + (-20*I*A*B - I*B^2)*a*b^3*d^2)*g^3*x^5 - 5*((-4*I*A*B + I*B^2)*b^4*
c^2 + 2*(-16*I*A*B + I*B^2)*a*b^3*c*d + 3*(-8*I*A*B - I*B^2)*a^2*b^2*d^2)*g
^3*x^4 - 20*(-12*I*A*B*a^2*b^2*c*d + (-4*I*A*B + I*B^2)*a*b^3*c^2 + (-4*I*A
*B - I*B^2)*a^3*b*d^2)*g^3*x^3 - 10*(3*(-4*I*A*B + I*B^2)*a^2*b^2*c^2 + 2*(
-8*I*A*B - I*B^2)*a^3*b*c*d + (-2*I*A*B - I*B^2)*a^4*d^2)*g^3*x^2 - 20*((-4
*I*A*B + I*B^2)*a^3*b*c^2 + (-2*I*A*B - I*B^2)*a^4*c*d)*g^3*x)*log((b*x + a
)*e/(d*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(I*d*x + I*c)*(B*log((b*x + a)*e/(d*x + c)) + A)^
2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)^3\,(c\,i+d\,i\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x
)
```

3.56 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=450

$$-\frac{B^2(bc-ad)^3g^2ix}{3bd^2}+\frac{B^2(bc-ad)^2g^2i(c+dx)^2}{12d^3}-\frac{B(bc-ad)^2g^2i(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{12b^2d}-\frac{B(bc-$$

```
[Out] -1/3*B^2*(-a*d+b*c)^3*g^2*i*x/b/d^2+1/12*B^2*(-a*d+b*c)^2*g^2*i*(d*x+c)^2/d
^3-1/12*B*(-a*d+b*c)^2*g^2*i*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2/d-1/
6*B*(-a*d+b*c)*g^2*i*(b*x+a)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2+1/12*(-a*d+b
*c)*g^2*i*(b*x+a)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^2+1/4*g^2*i*(b*x+a)^3*(
d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b+1/12*B*(-a*d+b*c)^3*g^2*i*(b*x+a)*(2
*A+B+2*B*ln(e*(b*x+a)/(d*x+c)))/b^2/d^2+1/12*B*(-a*d+b*c)^4*g^2*i*ln((-a*d+
b*c)/b/(d*x+c))*(2*A+3*B+2*B*ln(e*(b*x+a)/(d*x+c)))/b^2/d^3+1/6*B^2*(-a*d+b
*c)^4*g^2*i*ln(d*x+c)/b^2/d^3+1/6*B^2*(-a*d+b*c)^4*g^2*i*polylog(2,d*(b*x+a
)/b/(d*x+c))/b^2/d^3
```

Rubi [A]
time = 0.37, antiderivative size = 450, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2562, 2383, 2381, 2384, 2354, 2438, 2373, 45}

$$\frac{B^2g^2i(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{6b^2d^3}+\frac{Bg^2i(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+3B\right)}{12b^2d^3}+\frac{Bg^2i(a+bx)(bc-ad)^3\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+B\right)}{12b^2d^2}-\frac{Bg^2i(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{12b^2d}+\frac{g^2i(a+bx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{12b^2}-\frac{Bg^2i(a+bx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6b^2}+\frac{g^2i(a+bx)^3(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4b}+\frac{B^2g^2i(bc-ad)^4\log(c+dx)}{6b^2d^3}+\frac{B^2g^2i(c+dx)^2(bc-ad)^2}{12d^3}-\frac{B^2g^2ix(bc-ad)^3}{3bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -1/3*(B^2*(b*c - a*d)^3*g^2*i*x)/(b*d^2) + (B^2*(b*c - a*d)^2*g^2*i*(c + d*
x)^2)/(12*d^3) - (B*(b*c - a*d)^2*g^2*i*(a + b*x)^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(12*b^2*d) - (B*(b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(6*b^2) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*Log
[(e*(a + b*x))/(c + d*x)])^2)/(12*b^2) + (g^2*i*(a + b*x)^3*(c + d*x)*(A +
B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b) + (B*(b*c - a*d)^3*g^2*i*(a + b*x)
*(2*A + B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(12*b^2*d^2) + (B*(b*c - a*d
)^4*g^2*i*Log[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B + 2*B*Log[(e*(a + b*x))
/(c + d*x)]))/(12*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*Log[c + d*x])/(6*b^2*
d^3) + (B^2*(b*c - a*d)^4*g^2*i*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(6
*b^2*d^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (56c+56dx)(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx=\int\left(\frac{56(bc-ad)(ag+bgx)^2\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b}\right.$$

$$=\frac{(56(bc-ad))\int(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b}$$

$$=\frac{56(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2}$$

$$=\frac{56(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2}$$

$$=\frac{56(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2}$$

$$=\frac{56(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B(bc-ad)^2g^2(a+b}{3}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}+\frac{28B^2(bc-ad)^3g^2(a+b}{3b^2d^2}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}+\frac{28B^2(bc-ad)^3g^2(a+b}{3b^2d^2}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B^2(bc-ad)^3g^2x}{3bd^2}+$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B^2(bc-ad)^3g^2x}{3bd^2}+$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B^2(bc-ad)^3g^2x}{3bd^2}+$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B^2(bc-ad)^3g^2x}{3bd^2}+$$

Mathematica [A]

time = 0.36, size = 680, normalized size = 1.51

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2,x]
```

```
[Out] (g^2*i*(4*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
3*d*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (4*B*(b*c - a*d)^2
*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c
+ d*x)] - d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c -
 a*d)^2*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
*Log[c + d*x] + B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + B*(b*
c - a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*
x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3 - (B*(b*c - a*d)*(6*A*b
*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d
*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d
)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log
[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c -
 a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Log[c + d
*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*
x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(12*b^2
)
```

Maple [F]
time = 0.31, size = 0, normalized size = 0.00

$$\int (bgx+ag)^2\,(dix+ci)\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1888 vs. 2(425) = 850.
time = 0.39, size = 1888, normalized size = 4.20

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="maxima")
```

```
[Out] 1/4*I*A^2*b^2*d*g^2*x^4 + 1/3*I*A^2*b^2*c*g^2*x^3 + 2/3*I*A^2*a*b*d*g^2*x^3
 + I*A^2*a*b*c*g^2*x^2 + 1/2*I*A^2*a^2*d*g^2*x^2 + 2*I*(x*log(b*x*e/(d*x +
```

```
c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a^2*c*g^2 +
2*I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*
log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a*b*c*g^2 + 1/3*I*(2*x^3*log(b*
x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*
b^2*c*g^2 + I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/
b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*d*g^2 + 2/3*I*(2*
x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*l
og(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*
d^2))*A*B*a*b*d*g^2 + 1/12*I*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) -
6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3
)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))
*A*B*b^2*d*g^2 + I*A^2*a^2*c*g^2*x - 1/12*(3*I*b^3*c^4*g^2 - 10*I*a*b^2*c^3
*d*g^2 + 11*I*a^2*b*c^2*d^2*g^2 + 2*I*a^3*c*d^3*g^2)*B^2*log(d*x + c)/(b*d^
3) - 1/6*(I*b^4*c^4*g^2 - 4*I*a*b^3*c^3*d*g^2 + 6*I*a^2*b^2*c^2*d^2*g^2 - 4
*I*a^3*b*c*d^3*g^2 + I*a^4*d^4*g^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c -
a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^3) + 1/12*(3*I*B^
2*b^4*d^4*g^2*x^4 - 2*(-I*b^4*c*d^3*g^2 - 5*I*a*b^3*d^4*g^2)*B^2*x^3 - 6*(-
I*a*b^3*c*d^3*g^2 - 2*I*a^2*b^2*d^4*g^2)*B^2*x^2 + (I*b^4*c^3*d*g^2 - 3*I*a
*b^3*c^2*d^2*g^2 + 9*I*a^2*b^2*c*d^3*g^2 + 5*I*a^3*b*d^4*g^2)*B^2*x + (3*I*
B^2*b^4*d^4*g^2*x^4 + 12*I*B^2*a^2*b^2*c*d^3*g^2*x - 4*(-I*b^4*c*d^3*g^2 -
2*I*a*b^3*d^4*g^2)*B^2*x^3 - 6*(-2*I*a*b^3*c*d^3*g^2 - I*a^2*b^2*d^4*g^2)*B
^2*x^2 + (4*I*a^3*b*c*d^3*g^2 - I*a^4*d^4*g^2)*B^2)*log(b*x + a)^2 + (3*I*B
^2*b^4*d^4*g^2*x^4 + 12*I*B^2*a^2*b^2*c*d^3*g^2*x - 4*(-I*b^4*c*d^3*g^2 - 2
*I*a*b^3*d^4*g^2)*B^2*x^3 - 6*(-2*I*a*b^3*c*d^3*g^2 - I*a^2*b^2*d^4*g^2)*B^
2*x^2 + (I*b^4*c^4*g^2 - 4*I*a*b^3*c^3*d*g^2 + 6*I*a^2*b^2*c^2*d^2*g^2)*B^2
)*log(d*x + c)^2 + (6*I*B^2*b^4*d^4*g^2*x^4 - 6*(-I*b^4*c*d^3*g^2 - 3*I*a*b
^3*d^4*g^2)*B^2*x^3 + (-I*b^4*c^2*d^2*g^2 + 20*I*a*b^3*c*d^3*g^2 + 17*I*a^2
*b^2*d^4*g^2)*B^2*x^2 - 2*(-I*b^4*c^3*d*g^2 + 4*I*a*b^3*c^2*d^2*g^2 - 14*I*
a^2*b^2*c*d^3*g^2 - I*a^3*b*d^4*g^2)*B^2*x + (2*I*a*b^3*c^3*d*g^2 - 7*I*a^2
*b^2*c^2*d^2*g^2 + 14*I*a^3*b*c*d^3*g^2 - 3*I*a^4*d^4*g^2)*B^2)*log(b*x + a
) + (-6*I*B^2*b^4*d^4*g^2*x^4 - 6*(I*b^4*c*d^3*g^2 + 3*I*a*b^3*d^4*g^2)*B^2
*x^3 + (I*b^4*c^2*d^2*g^2 - 20*I*a*b^3*c*d^3*g^2 - 17*I*a^2*b^2*d^4*g^2)*B^
2*x^2 - 2*(I*b^4*c^3*d*g^2 - 4*I*a*b^3*c^2*d^2*g^2 + 14*I*a^2*b^2*c*d^3*g^2
 + I*a^3*b*d^4*g^2)*B^2*x - 2*(3*I*B^2*b^4*d^4*g^2*x^4 + 12*I*B^2*a^2*b^2*c
*d^3*g^2*x + 4*(I*b^4*c*d^3*g^2 + 2*I*a*b^3*d^4*g^2)*B^2*x^3 + 6*(2*I*a*b^3
*c*d^3*g^2 + I*a^2*b^2*d^4*g^2)*B^2*x^2 + (4*I*a^3*b*c*d^3*g^2 - I*a^4*d^4*
g^2)*B^2)*log(b*x + a))*log(d*x + c))/(b^2*d^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="fricas")
```

```
[Out] 1/12*(3*I*B^2*b^2*d*g^2*x^4 + 12*I*B^2*a^2*c*g^2*x - 4*(-I*B^2*b^2*c - 2*I*
B^2*a*b*d)*g^2*x^3 - 6*(-2*I*B^2*a*b*c - I*B^2*a^2*d)*g^2*x^2)*log((b*x + a
)*e/(d*x + c))^2 + integral(1/6*(6*I*A^2*b^3*d^2*g^2*x^5 + 6*I*A^2*a^3*c^2*
g^2 - 6*(-2*I*A^2*b^3*c*d - 3*I*A^2*a*b^2*d^2)*g^2*x^4 - 6*(-I*A^2*b^3*c^2
- 6*I*A^2*a*b^2*c*d - 3*I*A^2*a^2*b*d^2)*g^2*x^3 - 6*(-3*I*A^2*a*b^2*c^2 -
6*I*A^2*a^2*b*c*d - I*A^2*a^3*d^2)*g^2*x^2 - 6*(-3*I*A^2*a^2*b*c^2 - 2*I*A^
2*a^3*c*d)*g^2*x + (12*I*A*B*b^3*d^2*g^2*x^5 + 12*I*A*B*a^3*c^2*g^2 - 3*((-
8*I*A*B + I*B^2)*b^3*c*d + (-12*I*A*B - I*B^2)*a*b^2*d^2)*g^2*x^4 - 4*((-3*
I*A*B + I*B^2)*b^3*c^2 + (-18*I*A*B + I*B^2)*a*b^2*c*d + (-9*I*A*B - 2*I*B^
2)*a^2*b*d^2)*g^2*x^3 - 6*(2*(-3*I*A*B + I*B^2)*a*b^2*c^2 + (-12*I*A*B - I*
B^2)*a^2*b*c*d + (-2*I*A*B - I*B^2)*a^3*d^2)*g^2*x^2 - 12*((-3*I*A*B + I*B^
2)*a^2*b*c^2 + (-2*I*A*B - I*B^2)*a^3*c*d)*g^2*x)*log((b*x + a)*e/(d*x + c)
))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(I*d*x + I*c)*(B*log((b*x + a)*e/(d*x + c)) + A)^
2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(a\,g+b\,g\,x\right)}^2\,\left(c\,i+d\,i\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x
)
```

3.57 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=343

$$\frac{B^2(bc-ad)^2gix}{3bd}-\frac{B(bc-ad)^2gi(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2d}-\frac{B(bc-ad)gi(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{3b^2}$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*g*i*x/b/d-1/3*B*(-a*d+b*c)^2*g*i*(b*x+a)*(A+B*ln(e*(b*
x+a)/(d*x+c)))/b^2/d-1/3*B*(-a*d+b*c)*g*i*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+
c)))/b^2+1/6*(-a*d+b*c)*g*i*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^2+1/3
*g*i*(b*x+a)^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b-1/3*B*(-a*d+b*c)^3*g
*i*ln((-a*d+b*c)/b/(d*x+c))*(A+B+B*ln(e*(b*x+a)/(d*x+c)))/b^2/d^2-1/3*B^2*(
-a*d+b*c)^3*g*i*ln(d*x+c)/b^2/d^2-1/3*B^2*(-a*d+b*c)^3*g*i*polylog(2,d*(b*x
+a)/b/(d*x+c))/b^2/d^2
```

Rubi [A]
time = 0.24, antiderivative size = 343, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.210$, Rules used = {2562, 2383, 2381, 2384, 2354, 2438, 2373, 45}

$$-\frac{B^2gi(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b^2d^2}-\frac{Bgi(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A+B\right)}{3b^2d^2}-\frac{Bgi(a+bx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^2d}+\frac{gi(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{6b^2}-\frac{Bgi(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^2}+\frac{gi(a+bx)^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3b}-\frac{B^2gi(bc-ad)^3\log(c+dx)}{3b^2d^2}+\frac{B^2gix(bc-ad)^2}{3bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (B^2*(b*c - a*d)^2*g*i*x)/(3*b*d) - (B*(b*c - a*d)^2*g*i*(a + b*x)*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(3*b^2*d) - (B*(b*c - a*d)*g*i*(a + b*x)^2*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^2) + ((b*c - a*d)*g*i*(a + b*x)^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(6*b^2) + (g*i*(a + b*x)^2*(c + d*x
)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b) - (B*(b*c - a*d)^3*g*i*Log[
(b*c - a*d)/(b*(c + d*x))]*(A + B + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^2
*d^2) - (B^2*(b*c - a*d)^3*g*i*Log[c + d*x])/(3*b^2*d^2) - (B^2*(b*c - a*d)
^3*g*i*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*b^2*d^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
```

```
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
```

```
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$
\begin{aligned}
\int (57c+57dx)(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx &= \int \left(57acg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+57(b\right. \\
&= (57acg)\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx + (\\
&= 57acgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{57}{2}(bc+ \\
&= 57acgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{57}{2}(bc+ \\
&= 57acgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{57}{2}(bc+ \\
&= 57acgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{57}{2}(bc+ \\
&= -\frac{19AB(bc-ad)(bc+ad)gx}{bd}-19B(bc-ad) \\
&= -\frac{19AB(bc-ad)(bc+ad)gx}{bd}-\frac{19B^2(bc-ad}{} \\
&= -\frac{19AB(bc-ad)(bc+ad)gx}{bd}-\frac{19B^2(bc-ad}{} \\
&= \frac{19B^2(bc-ad)^2gx}{bd}-\frac{19AB(bc-ad)(bc+ad)}{bd} \\
&= \frac{19B^2(bc-ad)^2gx}{bd}-\frac{19AB(bc-ad)(bc+ad)}{bd} \\
&= \frac{19B^2(bc-ad)^2gx}{bd}-\frac{19AB(bc-ad)(bc+ad)}{bd} \\
&= \frac{19B^2(bc-ad)^2gx}{bd}-\frac{19AB(bc-ad)(bc+ad)}{bd}
\end{aligned}
$$

Mathematica [**B**] Leaf count is larger than twice the leaf count of optimal. 869 vs. $2(343) = 686$.

time = 0.49, size = 869, normalized size = 2.53

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^
2,x]
```

```
[Out] (g*i*(-6*A*b^2*B*c*d*(b*c - a*d)*x + 6*a*A*b*B*d^2*(-(b*c) + a*d)*x + 4*A*b
*B*d*(b*c - a*d)*(b*c + a*d)*x - 6*b*B^2*c*d*(b*c - a*d)*(a + b*x)*Log[(e*(
a + b*x))/(c + d*x)] + 6*a*B^2*d^2*(-(b*c) + a*d)*(a + b*x)*Log[(e*(a + b*x
))/(c + d*x)] + 4*B^2*d*(b*c - a*d)*(b*c + a*d)*(a + b*x)*Log[(e*(a + b*x))
/(c + d*x)] - 2*b^2*B*d^2*(b*c - a*d)*x^2*(A + B*Log[(e*(a + b*x))/(c + d*x
)]) + 6*a^2*b*B*c*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2
*a^3*B*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*a*b^2*c*d^
2*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 3*b^2*d^2*(b*c + a*d)*x^2*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])^2 + 2*b^3*d^3*x^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)])^2 + 6*b*B^2*c*(b*c - a*d)^2*Log[c + d*x] + 6*a*B^2*d*(b*c - a*
d)^2*Log[c + d*x] - 4*B^2*(b*c - a*d)^2*(b*c + a*d)*Log[c + d*x] + 2*b^3*B*
c^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 6*a*b^2*B*c^2*d*(A
+ B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 2*B^2*(b*c - a*d)*(a^2*d^2
*Log[a + b*x] - b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*a^2*b*B^2*
c*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + a^3*B^2*d^3*(Log[a + b*x]*(Log[a
 + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-
(b*c) + a*d)]) - b^3*B^2*c^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
+ d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 3*a*b^2*B
^2*c^2*d*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
 + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(6*b^2*d^2)
```

Maple [**F**]
time = 0.17, size = 0, normalized size = 0.00

$$\int (bgx + ag)(dix + ci)\left(A + B\ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1100 vs. 2(323) = 646.
time = 0.38, size = 1100, normalized size = 3.21

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorit
hm="maxima")
```

```
[Out] 1/3*I*A^2*b*d*g*x^3 + 1/2*I*A^2*b*c*g*x^2 + 1/2*I*A^2*a*d*g*x^2 + 2*I*(x*lo
g(b*x*e/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A
*B*a*c*g + I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b
^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*b*c*g + I*(x^2*log(b*x
*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2
 - (b*c - a*d)*x/(b*d))*A*B*a*d*g + 1/3*I*(2*x^3*log(b*x*e/(d*x + c) + a*e/
(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d -
a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b*d*g + I*A^2*a*c*g*
x - 1/3*(-I*b^2*c^3*g + 2*I*a*b*c^2*d*g + I*a^2*c*d^2*g)*B^2*log(d*x + c)/(
b*d^2) - 1/3*(-I*b^3*c^3*g + 3*I*a*b^2*c^2*d*g - 3*I*a^2*b*c*d^2*g + I*a^3*
d^3*g)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a
*d)/(b*c - a*d)))*B^2/(b^2*d^2) + 1/6*(2*I*B^2*b^3*d^3*g*x^3 + (I*b^3*c*d^2
*g + 5*I*a*b^2*d^3*g)*B^2*x^2 - 2*(-I*a*b^2*c*d^2*g - 2*I*a^2*b*d^3*g)*B^2*
x + (2*I*B^2*b^3*d^3*g*x^3 + 6*I*B^2*a*b^2*c*d^2*g*x - 3*(-I*b^3*c*d^2*g -
I*a*b^2*d^3*g)*B^2*x^2 + (3*I*a^2*b*c*d^2*g - I*a^3*d^3*g)*B^2)*log(b*x + a
)^2 + (2*I*B^2*b^3*d^3*g*x^3 + 6*I*B^2*a*b^2*c*d^2*g*x - 3*(-I*b^3*c*d^2*g
- I*a*b^2*d^3*g)*B^2*x^2 + (-I*b^3*c^3*g + 3*I*a*b^2*c^2*d*g)*B^2)*log(d*x
+ c)^2 - 2*(-2*I*B^2*b^3*d^3*g*x^3 + 2*(-I*b^3*c*d^2*g - 2*I*a*b^2*d^3*g)*B
^2*x^2 + (I*b^3*c^2*d*g - 6*I*a*b^2*c*d^2*g - I*a^2*b*d^3*g)*B^2*x + (I*a*b
^2*c^2*d*g - 4*I*a^2*b*c*d^2*g + I*a^3*d^3*g)*B^2)*log(b*x + a) - 2*(2*I*B^
2*b^3*d^3*g*x^3 + 2*(I*b^3*c*d^2*g + 2*I*a*b^2*d^3*g)*B^2*x^2 + (-I*b^3*c^2
*d*g + 6*I*a*b^2*c*d^2*g + I*a^2*b*d^3*g)*B^2*x + (2*I*B^2*b^3*d^3*g*x^3 +
6*I*B^2*a*b^2*c*d^2*g*x + 3*(I*b^3*c*d^2*g + I*a*b^2*d^3*g)*B^2*x^2 + (3*I*
a^2*b*c*d^2*g - I*a^3*d^3*g)*B^2)*log(b*x + a))*log(d*x + c))/(b^2*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorit
hm="fricas")
```

```
[Out] 1/6*(2*I*B^2*b*d*g*x^3 + 6*I*B^2*a*c*g*x - 3*(-I*B^2*b*c - I*B^2*a*d)*g*x^2
)*log((b*x + a)*e/(d*x + c))^2 + integral(1/3*(3*I*A^2*b^2*d^2*g*x^4 + 3*I*
A^2*a^2*c^2*g - 6*(-I*A^2*b^2*c*d - I*A^2*a*b*d^2)*g*x^3 - 3*(-I*A^2*b^2*c^
2 - 4*I*A^2*a*b*c*d - I*A^2*a^2*d^2)*g*x^2 - 6*(-I*A^2*a*b*c^2 - I*A^2*a^2*
c*d)*g*x + (6*I*A*B*b^2*d^2*g*x^4 + 6*I*A*B*a^2*c^2*g - 2*((-6*I*A*B + I*B^
2)*b^2*c*d + (-6*I*A*B - I*B^2)*a*b*d^2)*g*x^3 - 3*(-8*I*A*B*a*b*c*d + (-2*
I*A*B + I*B^2)*b^2*c^2 + (-2*I*A*B - I*B^2)*a^2*d^2)*g*x^2 - 6*((-2*I*A*B +
```

```
 I*B^2)*a*b*c^2 + (-2*I*A*B - I*B^2)*a^2*c*d)*g*x)*log((b*x + a)*e/(d*x + c
)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorit
hm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(I*d*x + I*c)*(B*log((b*x + a)*e/(d*x + c)) + A)^2,
 x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)\,\left(c\,i+d\,i\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)*(c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

3.58 $\int (ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=203

$$-\frac{B(bc-ad)i(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2}+\frac{i(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2d}+\frac{B^2(bc-ad)^2i\log(c+d$$

```
[Out] -B*(-a*d+b*c)*i*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2+1/2*i*(d*x+c)^2*(A+
B*ln(e*(b*x+a)/(d*x+c)))^2/d+B^2*(-a*d+b*c)^2*i*ln(d*x+c)/b^2/d+B*(-a*d+b*c
)^2*i*(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(1-b*(d*x+c)/d/(b*x+a))/b^2/d-B^2*(-a*d
+b*c)^2*i*polylog(2,b*(d*x+c)/d/(b*x+a))/b^2/d
```

Rubi [A]

time = 0.15, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.233$, Rules used = {2552, 2356, 2389, 2379, 2438, 2351, 31}

$$-\frac{B^2i(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2d}+\frac{Bi(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2d}-\frac{Bi(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2}+\frac{i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2d}+\frac{B^2i(bc-ad)^2\log(c+dx)}{b^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -((B*(b*c - a*d)*i*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/b^2) + (
i*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*d) + (B^2*(b*c - a
*d)^2*i*Log[c + d*x])/(b^2*d) + (B*(b*c - a*d)^2*i*(A + B*Log[(e*(a + b*x))
/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*d) - (B^2*(b*c - a*
d)^2*i*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
```

```
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2552

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(
m + 1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a
 + b*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && EqQ[n
 + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d, 0] && IntegersQ[m, p] && EqQ[d*f
- c*g, 0] && (GtQ[p, 0] || LtQ[m, -1])
```

Rubi steps

$$\int (58c+58dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{29(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} - B\int \frac{3364(bc-ad)(c+a}{}$$

$$= \frac{29(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} - \frac{(58B(bc-ad))\int}{}$$

$$= \frac{29(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} - \frac{(58B(bc-ad))\int}{}$$

$$= \frac{29(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} - \frac{(58B(bc-ad))\int}{}$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B(bc-ad)^2\log(a+bx)\left(A+B\right.}{b^2d}$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right.}{b^2}$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right.}{b^2}$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right.}{b^2}$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right.}{b^2}$$

$$= -\frac{58AB(bc-ad)x}{b} + \frac{29B^2(bc-ad)^2\log^2(a+bx)}{b^2d} - \frac{58A}{}$$

$$= -\frac{58AB(bc-ad)x}{b} + \frac{29B^2(bc-ad)^2\log^2(a+bx)}{b^2d} - \frac{58A}{}$$

Mathematica [A]
time = 0.14, size = 205, normalized size = 1.01

$$\frac{i\left((c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2-\frac{B(bc-ad)\left((-bBc+aBd)\log^2(a+bx)+2\left(Abdx+Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+(-bBc+aBd)\log(c+dx)\right)+2(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)+B\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2B(bc-ad)\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)}{b^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (i*((c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*((-
(b*B*c) + a*B*d)*Log[a + b*x]^2 + 2*(A*b*d*x + B*d*(a + b*x)*Log[(e*(a + b*
```

```
x))/(c + d*x)] + (-(b*B*c) + a*B*d)*Log[c + d*x]) + 2*(b*c - a*d)*Log[a + b
*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)] + B*Log[(b*(c + d*x))/(b*c - a*d)])
 + 2*B*(b*c - a*d)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/b^2))/(2*d)
```

Maple [F]
time = 0.10, size = 0, normalized size = 0.00

$$\int (dix+ci)\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 534 vs. $2(200) = 400$.
time = 0.36, size = 534, normalized size = 2.63

$$\frac{1}{2}iA^2dx^2+2i\left(x\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)ABc+i\left(x^2\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)-\frac{a^2\log(bx+a)}{b^2}+\frac{c^2\log(dx+c)}{d^2}-\frac{(bc-ad)x}{bd}\right)ABd+iA^2cx-\frac{iB^2ac\log(dx+c)}{b}-\frac{(ib^2c^2-2iabcd+ia^2d^2)\left(\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B^2}{b^2d}+\frac{iB^2b^2d^2x^2+2iB^2abd^2x+(iB^2b^2d^2x^2+2iB^2b^2cdx+(2iabcd-ia^2d^2)B^2)\log(bx+a)^2+(iB^2b^2d^2x^2+2iB^2b^2cdx+iB^2b^2c^2)\log(dx+c)^2-2(-iB^2b^2d^2x^2-iB^2abcd+(-ib^2cd-iabd^2)B^2x)\log(bx+a)-2(iB^2b^2d^2x^2+(ib^2cd+iabd^2)B^2x+(iB^2b^2d^2x^2+2iB^2b^2cdx+(2iabcd-ia^2d^2)B^2)\log(bx+a))\log(dx+c)}{2b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 1/2*I*A^2*d*x^2 + 2*I*(x*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + a*log(b*x +
 a)/b - c*log(d*x + c)/d)*A*B*c + I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c
)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B
*d + I*A^2*c*x - I*B^2*a*c*log(d*x + c)/b - (I*b^2*c^2 - 2*I*a*b*c*d + I*a^
2*d^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a
*d)/(b*c - a*d)))*B^2/(b^2*d) + 1/2*(I*B^2*b^2*d^2*x^2 + 2*I*B^2*a*b*d^2*x
+ (I*B^2*b^2*d^2*x^2 + 2*I*B^2*b^2*c*d*x + (2*I*a*b*c*d - I*a^2*d^2)*B^2)*l
og(b*x + a)^2 + (I*B^2*b^2*d^2*x^2 + 2*I*B^2*b^2*c*d*x + I*B^2*b^2*c^2)*log
(d*x + c)^2 - 2*(-I*B^2*b^2*d^2*x^2 - I*B^2*a*b*c*d + (-I*b^2*c*d - I*a*b*d
^2)*B^2*x)*log(b*x + a) - 2*(I*B^2*b^2*d^2*x^2 + (I*b^2*c*d + I*a*b*d^2)*B^
2*x + (I*B^2*b^2*d^2*x^2 + 2*I*B^2*b^2*c*d*x + (2*I*a*b*c*d - I*a^2*d^2)*B^
2)*log(b*x + a))*log(d*x + c))/(b^2*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] 1/2*(I*B^2*d*x^2 + 2*I*B^2*c*x)*log((b*x + a)*e/(d*x + c))^2 + integral((I*
A^2*b*d^2*x^3 + I*A^2*a*c^2 + (2*I*A^2*b*c*d + I*A^2*a*d^2)*x^2 + (I*A^2*b*
```

```
c^2 + 2*I*A^2*a*c*d)*x + (2*I*A*B*b*d^2*x^3 + 2*I*A*B*a*c^2 + ((4*I*A*B - I
*B^2)*b*c*d + (2*I*A*B + I*B^2)*a*d^2)*x^2 - 2*((-I*A*B + I*B^2)*b*c^2 + (-
2*I*A*B - I*B^2)*a*c*d)*x)*log((b*x + a)*e/(d*x + c)))/(b*d*x^2 + a*c + (b*
c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
[Out] integrate((I*d*x + I*c)*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (c\,i+d\,i\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
[Out] int((c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

3.59 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=286

$$\frac{2B(bc-ad)i\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g}+\frac{di(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g}-\frac{(bc-ad)i\left(A+B\log\right.}{}$$

```
[Out] 2*B*(-a*d+b*c)*i*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2/g
+d*i*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^2/g-(-a*d+b*c)*i*(A+B*ln(e*(b*
x+a)/(d*x+c)))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^2/g+2*B^2*(-a*d+b*c)*i*polylog
(2,d*(b*x+a)/b/(d*x+c))/b^2/g+2*B*(-a*d+b*c)*i*(A+B*ln(e*(b*x+a)/(d*x+c)))*
polylog(2,b*(d*x+c)/d/(b*x+a))/b^2/g+2*B^2*(-a*d+b*c)*i*polylog(3,b*(d*x+c)
/d/(b*x+a))/b^2/g
```

Rubi [A]
time = 0.25, antiderivative size = 286, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2562, 2389, 2379, 2421, 6724, 2355, 2354, 2438}

$$\frac{2Bi(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g}+\frac{2B^2i(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^2g}+\frac{2B^2i(bc-ad)\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g}+\frac{2Bi(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g}+\frac{di(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^2g}-\frac{i(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x),x]
```

```
[Out] (2*B*(b*c - a*d)*i*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/(b^2*g) + (d*i*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^
2)/(b^2*g) - ((b*c - a*d)*i*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 -
(b*(c + d*x))/(d*(a + b*x))])/(b^2*g) + (2*B^2*(b*c - a*d)*i*PolyLog[2, (d*
(a + b*x))/(b*(c + d*x))])/(b^2*g) + (2*B*(b*c - a*d)*i*(A + B*Log[(e*(a +
b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g) + (2*B^2
*(b*c - a*d)*i*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
```

```
, p}, x] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(59c+59dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{59d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg} + \frac{59(bc-ad)\left(A+B\log\left(\frac{e}{}\right.\right.}{bg(a+bx)}\right.$$

$$= \frac{(59d)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{bg} + \frac{(59(bc-ad))\int \frac{\left(A+B\log\right.}{a}}{bg}$$

$$= \frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg} + \frac{59(bc-ad)\log(a+bx)\left(A+\right.}{b^2g}$$

$$= \frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg} + \frac{59(bc-ad)\log(a+bx)\left(A+\right.}{b^2g}$$

$$= \frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg} + \frac{59(bc-ad)\log(a+bx)\left(A+\right.}{b^2g}$$

$$= \frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg} + \frac{59(bc-ad)\log(a+bx)\left(A+\right.}{b^2g}$$

$$= \frac{118aBd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g} + \frac{59dx\left(A+B\log\right.}{bg}$$

$$= \frac{118aBd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g} + \frac{59dx\left(A+B\log\right.}{bg}$$

$$= -\frac{59B^2(bc-ad)\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} + \frac{118aBd\log(a+}{}$$

$$= -\frac{59B^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} - \frac{59B^2(bc-a}{}$$

$$= -\frac{59AB(bc-ad)\log^2(a+bx)}{b^2g} - \frac{59B^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)}{b^2g}$$

$$= -\frac{59aB^2d\log^2(a+bx)}{b^2g} - \frac{59AB(bc-ad)\log^2(a+bx)}{b^2g} - \frac{59B^2}{}$$

$$= -\frac{59aB^2d\log^2(a+bx)}{b^2g} - \frac{59AB(bc-ad)\log^2(a+bx)}{b^2g} - \frac{59B^2}{}$$

Mathematica [**B**] Leaf count is larger than twice the leaf count of optimal. 987 vs. 2(286) = 572.
time = 0.73, size = 987, normalized size = 3.45

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x),x]
```

```
[Out] (i*(3*A^2*b*d*x + 3*A^2*(b*c - a*d)*Log[a + b*x] - 3*A*B*(a*d*Log[a/b + x]^
2 - 2*a*d*Log[a/b + x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*
(b*c + a*d*Log[a + b*x] - a*d*Log[(d*(a + b*x))/(-(b*c) + a*d)]) + (-(b*d*x
) + a*d*Log[a + b*x])*Log[(e*(a + b*x))/(c + d*x)]) - 2*a*d*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)]) + 3*A*b*B*c*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Log[a
/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)]) - 2*(Log[c/d + x]*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) -
 B^2*(a*d*Log[a/b + x]^3 - 3*d*(2*b*x - 2*(a + b*x)*Log[a/b + x] + (a + b*x
)*Log[a/b + x]^2) - 3*b*(2*d*x - 2*(c + d*x)*Log[c/d + x] + (c + d*x)*Log[c
/d + x]^2) - 3*d*(b*x - a*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log
[(e*(a + b*x))/(c + d*x)])^2 + 6*(a*d + 2*b*d*x - b*d*x*Log[c/d + x] - b*c*
Log[c + d*x] + Log[a/b + x]*(-(d*(a + b*x)) + d*(a + b*x)*Log[c/d + x] + (b
*c - a*d)*Log[(b*(c + d*x))/(b*c - a*d)]) + (b*c - a*d)*PolyLog[2, (d*(a +
b*x))/(-(b*c) + a*d)]) - 3*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))
/(c + d*x)])*(-2*b*c + 2*a*d - 2*d*(a + b*x)*Log[a/b + x] + a*d*Log[a/b + x
]^2 + 2*Log[c/d + x]*(b*(c + d*x) - a*d*Log[(d*(a + b*x))/(-(b*c) + a*d)])
- 2*a*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 3*a*d*(Log[a/b + x]^2*(Log
[c/d + x] - Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Log[a/b + x]*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)] + 2*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d)]) +
3*a*d*(Log[c/d + x]^2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[c/d + x]*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[3, (b*(c + d*x))/(b*c - a*d
)])) - 3*b*B^2*c*(Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x))/(c +
d*x)]^2 - 2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b
*x))] - 2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])))/(3*b^2*g)
```

Maple [**F**]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{(dix + ci) \left(A + B \ln \left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{bgx + ag}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorit
hm="maxima")
```

```
[Out] I*A^2*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + I*A^2*c*log(b*g*x + a*g)/(b*g)
 - (-I*B^2*b*d*x + (-I*b*c + I*a*d)*B^2*log(b*x + a))*log(d*x + c)^2/(b^2*g
) - integrate((-2*I*A*B*b^2*c^2 - I*B^2*b^2*c^2 + (-2*I*A*B*b^2*d^2 - I*B^2
*b^2*d^2)*x^2 + (-I*B^2*b^2*d^2*x^2 - 2*I*B^2*b^2*c*d*x - I*B^2*b^2*c^2)*lo
g(b*x + a)^2 - 2*(2*I*A*B*b^2*c*d + I*B^2*b^2*c*d)*x - 2*(I*A*B*b^2*c^2 + I
*B^2*b^2*c^2 + (I*A*B*b^2*d^2 + I*B^2*b^2*d^2)*x^2 + 2*(I*A*B*b^2*c*d + I*B
^2*b^2*c*d)*x)*log(b*x + a) - 2*(-I*A*B*b^2*c^2 - I*B^2*b^2*c^2 + (-I*A*B*b
^2*d^2 - 2*I*B^2*b^2*d^2)*x^2 + (-2*I*A*B*b^2*c*d + (-2*I*b^2*c*d - I*a*b*d
^2)*B^2)*x + (-I*B^2*b^2*d^2*x^2 + (-3*I*b^2*c*d + I*a*b*d^2)*B^2*x + (-I*b
^2*c^2 - I*a*b*c*d + I*a^2*d^2)*B^2)*log(b*x + a))*log(d*x + c))/(b^3*d*g*x
^2 + a*b^2*c*g + (b^3*c*g + a*b^2*d*g)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorit
hm="fricas")
```

```
[Out] integral((I*A^2*d*x + I*A^2*c + (I*B^2*d*x + I*B^2*c)*log((b*x + a)*e/(d*x
+ c))^2 - 2*(-I*A*B*d*x - I*A*B*c)*log((b*x + a)*e/(d*x + c)))/(b*g*x + a*g
), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\left(\int \frac{A^2c}{a+bx}\,dx + \int \frac{A^2dx}{a+bx}\,dx + \int \frac{B^2c\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)^2}{a+bx}\,dx + \int \frac{2ABc\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx + \int \frac{B^2dx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)^2}{a+bx}\,dx + \int \frac{2ABdx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g),x)
```

```
[Out] i*(Integral(A**2*c/(a + b*x), x) + Integral(A**2*d*x/(a + b*x), x) + Integr
al(B**2*c*log(a*e/(c + d*x) + b*e*x/(c + d*x))**2/(a + b*x), x) + Integral(
```

```
2*A*B*c*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(a + b*x), x) + Integral(B**2*
d*x*log(a*e/(c + d*x) + b*e*x/(c + d*x))**2/(a + b*x), x) + Integral(2*A*B*
d*x*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(a + b*x), x))/g
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorit
hm="giac")
```

```
[Out] integrate((I*d*x + I*c)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g),
 x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x),x)
```

```
[Out] int(((c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x), x
)
```

3.60 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=241

$$-\frac{2B^2i(c+dx)}{bg^2(a+bx)}-\frac{2Bi(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)}-\frac{i(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)}-\frac{di\left(A+B\log\left(\frac{e(a}{c-}\right.\right.}{}$$

```
[Out] -2*B^2*i*(d*x+c)/b/g^2/(b*x+a)-2*B*i*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/
g^2/(b*x+a)-i*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b/g^2/(b*x+a)-d*i*(A+B*
ln(e*(b*x+a)/(d*x+c)))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^2/g^2+2*B*d*i*(A+B*ln(
e*(b*x+a)/(d*x+c)))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^2/g^2+2*B^2*d*i*polylo
g(3,b*(d*x+c)/d/(b*x+a))/b^2/g^2
```

Rubi [A]
time = 0.23, antiderivative size = 241, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$, Rules used = {2562, 2380, 2342, 2341, 2379, 2421, 6724}

$$\frac{2Bdi\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^2}+\frac{2B^2di\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2}-\frac{di\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^2g^2}-\frac{2Bi(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg^2(a+bx)}-\frac{i(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{bg^2(a+bx)}-\frac{2B^2i(c+dx)}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^2,
x]
```

```
[Out] (-2*B^2*i*(c + d*x))/(b*g^2*(a + b*x)) - (2*B*i*(c + d*x)*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]))/(b*g^2*(a + b*x)) - (i*(c + d*x)*(A + B*Log[(e*(a + b*
x))/(c + d*x)])^2)/(b*g^2*(a + b*x)) - (d*i*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (2*B*d*i*(A + B*L
og[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*
g^2) + (2*B^2*d*i*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(60c+60dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)^2} + \frac{60d\left(A+B\log\left(\frac{e}{}\right.\right.}{bg^2(a+bx}\right.$$

$$= \frac{(60d)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{bg^2} + \frac{(60(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{(a+bx)^2}}{bg^2}$$

$$= -\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2(a+bx)} + \frac{60d\log(a+bx)\left(A+\right.}{b^2g^2}$$

$$= -\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2(a+bx)} + \frac{60d\log(a+bx)\left(A+\right.}{b^2g^2}$$

$$= -\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2(a+bx)} + \frac{60d\log(a+bx)\left(A+\right.}{b^2g^2}$$

$$= -\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2(a+bx)} + \frac{60d\log(a+bx)\left(A+\right.}{b^2g^2}$$

$$= -\frac{120B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)} - \frac{120Bd\log(a+bx)}{}$$

$$= -\frac{120B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)} - \frac{120Bd\log(a+bx)}{}$$

$$= -\frac{60B^2d\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g^2} - \frac{120B(bc-ad)\left(A+B\log\right.}{b^2g^2(a+bx}$$

$$= -\frac{120B^2(bc-ad)}{b^2g^2(a+bx)} - \frac{120B^2d\log(a+bx)}{b^2g^2} - \frac{60B^2d\log\left(-\frac{bc-a}{d(a+b}\right.}{b^2g}$$

$$= -\frac{120B^2(bc-ad)}{b^2g^2(a+bx)} - \frac{120B^2d\log(a+bx)}{b^2g^2} - \frac{60ABd\log^2(a+bx}{b^2g^2}$$

$$= -\frac{120B^2(bc-ad)}{b^2g^2(a+bx)} - \frac{120B^2d\log(a+bx)}{b^2g^2} - \frac{60ABd\log^2(a+bx}{b^2g^2}$$

$$= -\frac{120B^2(bc-ad)}{b^2g^2(a+bx)} - \frac{120B^2d\log(a+bx)}{b^2g^2} - \frac{60ABd\log^2(a+bx}{b^2g^2}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1407 vs. $2(241) = 482$.
time = 1.29, size = 1407, normalized size = 5.84

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x)^2,x]
```

```
[Out] (i*((3*A^2*(-(b*c) + a*d))/(a + b*x) + 3*A^2*d*Log[a + b*x] - (6*A*b*B*c*(-
(d*(a + b*x)*Log[c/d + x]) + d*(a + b*x)*Log[(d*(a + b*x))/(-(b*c) + a*d)]
+ (b*c - a*d)*(1 + Log[(e*(a + b*x))/(c + d*x)])))/((b*c - a*d)*(a + b*x))
+ (3*b*B^2*c*(-2*b*c + 2*a*d - 2*d*(a + b*x)*Log[a + b*x] - 2*(b*c - a*d)*L
og[(e*(a + b*x))/(c + d*x)] - 2*d*(a + b*x)*Log[a + b*x]*Log[(e*(a + b*x))/
(c + d*x)] - (b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)]^2 + 2*d*(a + b*x)*Log
[c + d*x] - 2*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c
 + b*d*x)] + d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/
(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(
Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(
b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b
*c - a*d)*(a + b*x)) + 3*A*B*d*(Log[a/b + x]^2 - 2*Log[a/b + x]*Log[a + b*x
] - 2*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[a + b*x]*((a*d
)/(b*c - a*d) + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)]) + 2*a*((a + b*
x)^(-1) + Log[(e*(a + b*x))/(c + d*x)]/(a + b*x) + (d*Log[c + d*x])/(-(b*c)
 + a*d)) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + (B^2*d*((b*c - a*d)*(
a + b*x)*Log[a/b + x]^3 + 3*a*(b*c - a*d)*(2 + 2*Log[a/b + x] + Log[a/b + x
]^2) + 3*(b*c - a*d)*(a + (a + b*x)*Log[a + b*x])*(-Log[a/b + x] + Log[c/d
+ x] + Log[(e*(a + b*x))/(c + d*x)])^2 + 3*a*(d*(a + b*x)*Log[a/b + x]^2 +
2*((-(b*c) + a*d)*Log[c/d + x] + d*(a + b*x)*(Log[a + b*x] - Log[c + d*x]))
 - 2*Log[a/b + x]*((b*c - a*d)*Log[c/d + x] + d*(a + b*x)*Log[(b*(c + d*x))
/(b*c - a*d)]) - 2*d*(a + b*x)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) +
3*a*(Log[c/d + x]*(b*(c + d*x)*Log[c/d + x] - 2*d*(a + b*x)*Log[(d*(a + b*x
))/(-(b*c) + a*d)]) - 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
- 3*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)])*((b*c - a*
d)*(a + b*x)*Log[a/b + x]^2 + 2*a*(b*c - a*d)*(1 + Log[a/b + x]) + 2*a*(-(b
*c) + a*d)*Log[c/d + x] + 2*a*d*(a + b*x)*(Log[a + b*x] - Log[c + d*x]) - 2
*(b*c - a*d)*(a + b*x)*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])) - 3*(b*c - a*d)*(a + b*x)*(Log[a/b +
x]^2*(Log[c/d + x] - Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Log[a/b + x]*PolyL
og[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*PolyLog[3, (d*(a + b*x))/(-(b*c) +
a*d)]) + 3*(b*c - a*d)*(a + b*x)*(Log[c/d + x]^2*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] + 2*Log[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[
3, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(a + b*x))))/(3*b^2*g^2)
```

Maple [F]
time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algor
ithm="maxima")
```

```
[Out] I*A^2*d*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - 2*I*A*B*c*(l
og(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2*x +
a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2*c -
a*b*d)*g^2)) - I*A^2*c/(b^2*g^2*x + a*b*g^2) + ((-I*b*c + I*a*d)*B^2 + (I*B
^2*b*d*x + I*B^2*a*d)*log(b*x + a))*log(d*x + c)^2/(b^3*g^2*x + a*b^2*g^2)
- integrate((-I*B^2*b^2*c^2 + (-2*I*A*B*b^2*d^2 - I*B^2*b^2*d^2)*x^2 + (-I*
B^2*b^2*d^2*x^2 - 2*I*B^2*b^2*c*d*x - I*B^2*b^2*c^2)*log(b*x + a)^2 - 2*(I*
A*B*b^2*c*d + I*B^2*b^2*c*d)*x - 2*(I*B^2*b^2*c^2 + (I*A*B*b^2*d^2 + I*B^2*
b^2*d^2)*x^2 + (I*A*B*b^2*c*d + 2*I*B^2*b^2*c*d)*x)*log(b*x + a) - 2*((-I*b
^2*c^2 + I*a*b*c*d - I*a^2*d^2)*B^2 + (-I*A*B*b^2*d^2 - I*B^2*b^2*d^2)*x^2
+ (-I*A*B*b^2*c*d + (-I*b^2*c*d - I*a*b*d^2)*B^2)*x + (-2*I*B^2*b^2*d^2*x^2
 + 2*(-I*b^2*c*d - I*a*b*d^2)*B^2*x + (-I*b^2*c^2 - I*a^2*d^2)*B^2)*log(b*x
 + a))*log(d*x + c))/(b^4*d*g^2*x^3 + a^2*b^2*c*g^2 + (b^4*c*g^2 + 2*a*b^3*
d*g^2)*x^2 + (2*a*b^3*c*g^2 + a^2*b^2*d*g^2)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algor
ithm="fricas")
```

```
[Out] integral((I*A^2*d*x + I*A^2*c + (I*B^2*d*x + I*B^2*c)*log((b*x + a)*e/(d*x
+ c))^2 - 2*(-I*A*B*d*x - I*A*B*c)*log((b*x + a)*e/(d*x + c)))/(b^2*g^2*x^2
 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algor
ithm="giac")
```

```
[Out] integrate((I*d*x + I*c)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^
2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)\,{\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}^2}{{(a\,g+b\,g\,x)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^2,
x)
```

```
[Out] int(((c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^2,
 x)
```

3.61 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=141

$$-\frac{B^2i(c+dx)^2}{4(bc-ad)g^3(a+bx)^2}-\frac{Bi(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2(bc-ad)g^3(a+bx)^2}-\frac{i(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2(bc-ad)g^3(a+bx)^2}$$

```
[Out] -1/4*B^2*i*(d*x+c)^2/(-a*d+b*c)/g^3/(b*x+a)^2-1/2*B*i*(d*x+c)^2*(A+B*ln(e*(
b*x+a)/(d*x+c)))/(-a*d+b*c)/g^3/(b*x+a)^2-1/2*i*(d*x+c)^2*(A+B*ln(e*(b*x+a)
/(d*x+c)))^2/(-a*d+b*c)/g^3/(b*x+a)^2
```

Rubi [A]

time = 0.09, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.075$, Rules used = {2562, 2342, 2341}

$$-\frac{i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)}-\frac{Bi(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3(a+bx)^2(bc-ad)}-\frac{B^2i(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^3,
x]
```

```
[Out] -1/4*(B^2*i*(c + d*x)^2)/((b*c - a*d)*g^3*(a + b*x)^2) - (B*i*(c + d*x)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)*g^3*(a + b*x)^2) - (i*(
c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)*g^3*(a +
b*x)^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
```

```
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(61c+61dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx = \int \left(\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^3(a+bx)^3} + \frac{61d\left(A+B\log\left(\frac{e}{}\right.\right.}{bg^3(a+bx}\right.$$

$$= \frac{(61d)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}\,dx}{bg^3} + \frac{(61(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{(a+bx)^3}}{bg^3}$$

$$= -\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b^2g^3(a+bx)^2} - \frac{61d\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b^2g^3(a+bx)^2} - \frac{61d\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b^2g^3(a+bx)^2} - \frac{61d\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b^2g^3(a+bx)^2} - \frac{61d\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{61B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^3(a+bx)^2} - \frac{61Bd\left(A+B\log\left(\frac{e}{}\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{61B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^3(a+bx)^2} - \frac{61Bd\left(A+B\log\left(\frac{e}{}\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{61B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^3(a+bx)^2} - \frac{61Bd\left(A+B\log\left(\frac{e}{}\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{61B^2(bc-ad)}{4b^2g^3(a+bx)^2} - \frac{61B^2d}{2b^2g^3(a+bx)} - \frac{61B^2d^2\log(a+bx)}{2b^2(bc-ad)g^3} - \frac{61}{}$$

$$= -\frac{61B^2(bc-ad)}{4b^2g^3(a+bx)^2} - \frac{61B^2d}{2b^2g^3(a+bx)} - \frac{61B^2d^2\log(a+bx)}{2b^2(bc-ad)g^3} - \frac{61}{}$$

$$= -\frac{61B^2(bc-ad)}{4b^2g^3(a+bx)^2} - \frac{61B^2d}{2b^2g^3(a+bx)} - \frac{61B^2d^2\log(a+bx)}{2b^2(bc-ad)g^3} + \frac{61}{}$$

$$= -\frac{61B^2(bc-ad)}{4b^2g^3(a+bx)^2} - \frac{61B^2d}{2b^2g^3(a+bx)} - \frac{61B^2d^2\log(a+bx)}{2b^2(bc-ad)g^3} + \frac{61}{}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order

3 in optimal.
time = 0.59, size = 765, normalized size = 5.43

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x)^3,x]
```

```
[Out] -1/4*(i*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 4*d*(-(b*
c) + a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 4*B*d*(a + b*x
)*(2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d*(a + b*x)*Log[a
 + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*d*(a + b*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)])*Log[c + d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[a +
b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x
] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c)
+ a*d)]) + B*d*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*
x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B*(2*(b*c -
a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c) + a*d)*(a + b*x)*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A +
B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a
 + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)
*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x
]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/
(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*(a +
b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(b^2*(b*c - a*d)*g^3*(a + b*x)
^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 354 vs. $2(135) = 270$.
time = 0.59, size = 355, normalized size = 2.52

method	result
norman	$\frac{\frac{B^2 cdix \ln\left(\frac{e(bx+a)}{dx+c}\right)^2}{g(ad-cb)}+\frac{ciBd(2A+B)x \ln\left(\frac{e(bx+a)}{dx+c}\right)}{g(ad-cb)}-\frac{2A^2 aid+2A^2 bci+2adiBA+2bciBA+adi B^2+bci B^2}{4g b^2}-\frac{\left(2A^2 id+2diBA+di \right.}{2gb}}{g^2(bx+a)^2}$
derivativedivides	$-\frac{e(ad-cb)\left(-\frac{i d^2 e A^2}{2(ad-cb)^2 g^3 \left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}+\frac{2i d^2 eAB\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}-\frac{1}{4\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}\right)}{(ad-cb)^2 g^3}+\frac{i d^2 e B^2\left(-\frac{\ln\left(\frac{be}{d}\right.}{2\left(\frac{be}{d}\right.}\right.}{}\right.}{d^2}$

default	$-\frac{e(ad-cb)\left(-\frac{i\,d^{2} e\,A^{2}}{2(ad-cb)^{2} g^{3}\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}+\frac{2i\,d^{2} eAB\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}-\frac{1}{4\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}\right)}{(ad-cb)^{2} g^{3}}+\frac{i\,d^{2} e\,B^{2}\left(-\frac{\ln\left(\frac{be}{d}+\cdots\right.}{2\left(\frac{be}{d}+\cdots\right.}\right.}{\cdots}\right.}{d^{2}}$
risch	$\frac{i\,A^{2} ad}{2g^{3} b^{2}(bx+a)^{2}}-\frac{i\,A^{2} c}{2g^{3} b(bx+a)^{2}}-\frac{i\,A^{2} d}{g^{3} b^{2}(bx+a)}+\frac{i\,B^{2} e^{2} \ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^{2}}{2g^{3}(ad-cb)\left(\frac{be}{d}+\frac{ea}{dx+c}-\frac{ecb}{d(dx+c)}\right)^{2}}+\frac{i\,B^{2} e^{2} \ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{2g^{3}(ad-cb)\left(\frac{be}{d}+\frac{ea}{dx+c}-\cdots\right.}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/2*i*d^2*e/(a*d-b*c)^2/g^3*A^2/(b*e/d+(a*d-b*c)*e/d/(
d*x+c))^2+2*i*d^2*e/(a*d-b*c)^2/g^3*A*B*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)+i*d
^2*e/(a*d-b*c)^2/g^3*B^2*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))^2-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1991 vs. $2(134) = 268$.
time = 0.47, size = 1991, normalized size = 14.12

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algor
ithm="maxima")
```

```
[Out] -1/2*I*(2*b*x + a)*B^2*d*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^4*g^3*x^
2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + 1/4*I*(2*((2*b*d*x - b*c + 3*a*d)/((b^4*
c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d
)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d
^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3))*log(b*x*e/(d*x +
 c) + a*e/(d*x + c)) - (b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 +
2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*
d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*
x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*
(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))/(a^2*b^3*
c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^
3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d
^2*g^3)*x))*B^2*c - 1/4*I*(2*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b
^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*
b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^
```

```
2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d
+ a^2*b^2*d^2)*g^3))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + (7*a*b^2*c^2 -
8*a^2*b*c*d + a^3*d^2 - 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*
x^2 + 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x + a)^2 - 2*(2*a^2*b*c*d - a^3*
d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(d*x
+ c)^2 + 2*(4*b^3*c^2 - 5*a*b^2*c*d + a^2*b*d^2)*x + 2*(4*a^2*b*c*d - a^3*d
^2 + (4*b^3*c*d - a*b^2*d^2)*x^2 + 2*(4*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x +
 a) - 2*(4*a^2*b*c*d - a^3*d^2 + (4*b^3*c*d - a*b^2*d^2)*x^2 + 2*(4*a*b^2*c
*d - a^2*b*d^2)*x - 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2
+ 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x + a))*log(d*x + c))/(a^2*b^4*c^2*g
^3 - 2*a^3*b^3*c*d*g^3 + a^4*b^2*d^2*g^3 + (b^6*c^2*g^3 - 2*a*b^5*c*d*g^3 +
 a^2*b^4*d^2*g^3)*x^2 + 2*(a*b^5*c^2*g^3 - 2*a^2*b^4*c*d*g^3 + a^3*b^3*d^2*
g^3)*x))*B^2*d - 1/2*I*A*B*d*(2*(2*b*x + a)*log(b*x*e/(d*x + c) + a*e/(d*x
+ c))/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2
*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3
*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*
c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((
b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3)) + 1/2*I*A*B*c*((2*b*d*x - b*c +
3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^
2*c - a^3*b*d)*g^3) - 2*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2 +
 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d +
a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g
^3)) - 1/2*I*B^2*c*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^3*g^3*x^2 + 2*
a*b^2*g^3*x + a^2*b*g^3) - 1/2*I*(2*b*x + a)*A^2*d/(b^4*g^3*x^2 + 2*a*b^3*g
^3*x + a^2*b^2*g^3) - 1/2*I*A^2*c/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 291 vs. $2(134) = 268$.
time = 0.38, size = 291, normalized size = 2.06

$$-\frac{(2i\,A^2+2i\,AB+i\,B^2)b^2c^2+(-2i\,A^2-2i\,AB-i\,B^2)a^2d^2-2\left(-i\,B^2b^2d^2x^2-2i\,B^2b^2cdx-i\,B^2b^2c^2\right)\log\left(\frac{(bx+a)e}{dx+c}\right)^2-2\left((-2i\,A^2-2i\,AB-i\,B^2)b^2cd+(2i\,A^2+2i\,AB+i\,B^2)abd^2\right)x-2\left((-2i\,AB-i\,B^2)b^2d^2x^2+2\left(-2i\,AB-i\,B^2\right)b^2cdx+(-2i\,AB-i\,B^2)b^2c^2\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4\left((b^5c-ab^4d)g^3x^2+2\left(ab^4c-a^2b^3d\right)g^3x+(a^2b^3c-a^3b^2d)g^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algor
ithm="fricas")
```

```
[Out] -1/4*((2*I*A^2 + 2*I*A*B + I*B^2)*b^2*c^2 + (-2*I*A^2 - 2*I*A*B - I*B^2)*a^
2*d^2 - 2*(-I*B^2*b^2*d^2*x^2 - 2*I*B^2*b^2*c*d*x - I*B^2*b^2*c^2)*log((b*x
 + a)*e/(d*x + c))^2 - 2*((-2*I*A^2 - 2*I*A*B - I*B^2)*b^2*c*d + (2*I*A^2 +
 2*I*A*B + I*B^2)*a*b*d^2)*x - 2*((-2*I*A*B - I*B^2)*b^2*d^2*x^2 + 2*(-2*I*
A*B - I*B^2)*b^2*c*d*x + (-2*I*A*B - I*B^2)*b^2*c^2)*log((b*x + a)*e/(d*x +
 c)))/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3
*c - a^3*b^2*d)*g^3)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 714 vs. $2(122) = 244$.

time = 6.53, size = 714, normalized size = 5.06

$$-\frac{Bd^2i(2A+B)\log\left(x+\frac{2ABad^3i+2ABbcd^2i+B^2ad^3i+B^2bcd^2i-\frac{Ba^2d^4i(2A+B)}{ad-bc}+\frac{2Babcd^3i(2A+B)}{ad-bc}-\frac{Bb^2c^2d^2i(2A+B)}{ad-bc}}{4ABbd^3i+2B^2bd^3i}\right)}{2b^2g^3\,(ad-bc)}+\frac{Bd^2i(2A+B)\log\left(x+\frac{2ABad^3i+2ABbcd^2i+B^2ad^3i+B^2bcd^2i+\frac{Ba^2d^4i(2A+B)}{ad-bc}-\frac{2Babcd^3i(2A+B)}{ad-bc}+\frac{Bb^2c^2d^2i(2A+B)}{ad-bc}}{4ABbd^3i+2B^2bd^3i}\right)}{2b^2g^3\,(ad-bc)}+\frac{(B^2c^2i+2B^2cdix+B^2d^2ix^2)\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2a^3dg^3-2a^2bcg^3+4a^2bdg^3x-4ab^2cg^3x+2ab^2dg^3x^2-2b^3cg^3x^2}+\frac{-2A^2adi-2A^2bci-2ABadi-2ABbci-B^2adi-B^2bci+x(-4A^2bdi-4ABbdi-2B^2bdi)}{4a^2b^2g^3+8ab^3g^3x+4b^4g^3x^2}+\frac{(-2ABadi-2ABbci-4ABbdix-B^2adi-B^2bci-2B^2bdix)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2a^2b^2g^3+4ab^3g^3x+2b^4g^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] -B*d**2*i*(2*A + B)*log(x + (2*A*B*a*d**3*i + 2*A*B*b*c*d**2*i + B**2*a*d**
3*i + B**2*b*c*d**2*i - B*a**2*d**4*i*(2*A + B)/(a*d - b*c) + 2*B*a*b*c*d**
3*i*(2*A + B)/(a*d - b*c) - B*b**2*c**2*d**2*i*(2*A + B)/(a*d - b*c))/(4*A*
B*b*d**3*i + 2*B**2*b*d**3*i))/(2*b**2*g**3*(a*d - b*c)) + B*d**2*i*(2*A +
B)*log(x + (2*A*B*a*d**3*i + 2*A*B*b*c*d**2*i + B**2*a*d**3*i + B**2*b*c*d*
*2*i + B*a**2*d**4*i*(2*A + B)/(a*d - b*c) - 2*B*a*b*c*d**3*i*(2*A + B)/(a*
d - b*c) + B*b**2*c**2*d**2*i*(2*A + B)/(a*d - b*c))/(4*A*B*b*d**3*i + 2*B*
*2*b*d**3*i))/(2*b**2*g**3*(a*d - b*c)) + (B**2*c**2*i + 2*B**2*c*d*i*x + B
**2*d**2*i*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*d*g**3 - 2*a**2*b*c*
g**3 + 4*a**2*b*d*g**3*x - 4*a*b**2*c*g**3*x + 2*a*b**2*d*g**3*x**2 - 2*b**
3*c*g**3*x**2) + (-2*A**2*a*d*i - 2*A**2*b*c*i - 2*A*B*a*d*i - 2*A*B*b*c*i
- B**2*a*d*i - B**2*b*c*i + x*(-4*A**2*b*d*i - 4*A*B*b*d*i - 2*B**2*b*d*i))
/(4*a**2*b**2*g**3 + 8*a*b**3*g**3*x + 4*b**4*g**3*x**2) + (-2*A*B*a*d*i -
2*A*B*b*c*i - 4*A*B*b*d*i*x - B**2*a*d*i - B**2*b*c*i - 2*B**2*b*d*i*x)*log
(e*(a + b*x)/(c + d*x))/(2*a**2*b**2*g**3 + 4*a*b**3*g**3*x + 2*b**4*g**3*x
**2)
```

Giac [A]
time = 3.05, size = 180, normalized size = 1.28

$$\frac{\left(-2i\,B^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)^2-4i\,ABe^3\log\left(\frac{bxe+ae}{dx+c}\right)-2i\,B^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)-2i\,A^2e^3-2i\,ABe^3-i\,B^2e^3\right)(dx+c)^2\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{4\,(bxe+ae)^2g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algor
ithm="giac")
```

```
[Out] 1/4*(-2*I*B^2*e^3*log((b*x*e + a*e)/(d*x + c))^2 - 4*I*A*B*e^3*log((b*x*e +
 a*e)/(d*x + c)) - 2*I*B^2*e^3*log((b*x*e + a*e)/(d*x + c)) - 2*I*A^2*e^3 -
 2*I*A*B*e^3 - I*B^2*e^3)*(d*x + c)^2*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) -
a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^2*g^3)
```

Mupad [B]
time = 6.18, size = 469, normalized size = 3.33

$$-\frac{x\,(2\,b\,d\,i\,A^2+2\,b\,d\,i\,A\,B+b\,d\,i\,B^2)+A^2\,a\,d\,i+A^2\,b\,c\,i+\frac{B^2\,a\,d\,i}{2}+\frac{B^2\,b\,c\,i}{2}+A\,B\,a\,d\,i+A\,B\,b\,c\,i}{2\,a^2\,b^2\,g^3+4\,a\,b^3\,g^3\,x+2\,b^4\,g^3\,x^2}-\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2\left(\frac{\frac{B^2\,c\,i}{2\,b^2\,g^3}+\frac{B^2\,a\,d\,i}{2\,b^3\,g^3}+\frac{B^2\,d\,i\,x}{b^2\,g^3}}{2\,a\,x+b\,x^2+\frac{a^2}{b}}-\frac{B^2\,d^2\,i}{2\,b^2\,g^3\,(a\,d-b\,c)}\right)-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\left(x\left(\frac{B^2\,i}{b^2\,g^3}+\frac{2\,A\,B\,i}{b^2\,g^3}\right)+\frac{A\,B\,a\,i}{b^3\,g^3}+\frac{B\,i\,(A\,b\,c-B\,a\,d+B\,b\,c)}{b^3\,d\,g^3}+\frac{B^2\,d^2\,i\left(\frac{2\,a^2\,d^2-3\,a\,b\,c\,d+b^2\,c^2}{2\,b\,d^3}+\frac{a\,(a\,d-b\,c)}{2\,b\,d^2}\right)}{b^2\,g^3\,(a\,d-b\,c)}\right)}{\frac{b\,x^2}{d}+\frac{a^2}{b\,d}+\frac{2\,a\,x}{d}}-\frac{B\,d^2\,i\,\mathrm{atan}\left(\frac{\left(\frac{2\,c\,b^3\,g^3+2\,a\,d\,b^2\,g^3}{2\,b^2\,g^3}+2\,b\,d\,x\right)\,1{}\mathrm{i}}{a\,d-b\,c}\right)\,(2\,A+B)\,1{}\mathrm{i}}{b^2\,g^3\,(a\,d-b\,c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^3,
x)

[Out] - (x*(2*A^2*b*d*i + B^2*b*d*i + 2*A*B*b*d*i) + A^2*a*d*i + A^2*b*c*i + (B^2
*a*d*i)/2 + (B^2*b*c*i)/2 + A*B*a*d*i + A*B*b*c*i)/(2*a^2*b^2*g^3 + 2*b^4*g
^3*x^2 + 4*a*b^3*g^3*x) - log((e*(a + b*x))/(c + d*x))^2*(((B^2*c*i)/(2*b^2
*g^3) + (B^2*a*d*i)/(2*b^3*g^3) + (B^2*d*i*x)/(b^2*g^3))/(2*a*x + b*x^2 + a
^2/b) - (B^2*d^2*i)/(2*b^2*g^3*(a*d - b*c))) - (log((e*(a + b*x))/(c + d*x)
)*(x*((B^2*i)/(b^2*g^3) + (2*A*B*i)/(b^2*g^3)) + (A*B*a*i)/(b^3*g^3) + (B*i
*(A*b*c - B*a*d + B*b*c))/(b^3*d*g^3) + (B^2*d^2*i*((2*a^2*d^2 + b^2*c^2 -
3*a*b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)))/(b^2*g^3*(a*d - b*c))))/
((b*x^2)/d + a^2/(b*d) + (2*a*x)/d) - (B*d^2*i*atan((((2*b^3*c*g^3 + 2*a*b^
2*d*g^3)/(2*b^2*g^3) + 2*b*d*x)*1i)/(a*d - b*c))*(2*A + B)*1i)/(b^2*g^3*(a*
d - b*c))
```

3.62 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=287

$$\frac{B^2di(c+dx)^2}{4(bc-ad)^2g^4(a+bx)^2}-\frac{2bB^2i(c+dx)^3}{27(bc-ad)^2g^4(a+bx)^3}+\frac{Bdi(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2(bc-ad)^2g^4(a+bx)^2}-\frac{2bBi(c+dx)^3\left(A\right.}{9(bc-ad)^2}$$

```
[Out] 1/4*B^2*d*i*(d*x+c)^2/(-a*d+b*c)^2/g^4/(b*x+a)^2-2/27*b*B^2*i*(d*x+c)^3/(-a
*d+b*c)^2/g^4/(b*x+a)^3+1/2*B*d*i*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a
*d+b*c)^2/g^4/(b*x+a)^2-2/9*b*B*i*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a
*d+b*c)^2/g^4/(b*x+a)^3+1/2*d*i*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a
*d+b*c)^2/g^4/(b*x+a)^2-1/3*b*i*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a
*d+b*c)^2/g^4/(b*x+a)^3
```

Rubi [A]
time = 0.18, antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 2395, 2342, 2341}

$$-\frac{bi(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)^2}-\frac{2bBi(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^2}+\frac{di(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^4(a+bx)^2(bc-ad)^2}+\frac{Bdi(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^4(a+bx)^2(bc-ad)^2}-\frac{2bB^2i(c+dx)^3}{27g^4(a+bx)^3(bc-ad)^2}+\frac{B^2di(c+dx)^2}{4g^4(a+bx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^4,
x]
```

```
[Out] (B^2*d*i*(c + d*x)^2)/(4*(b*c - a*d)^2*g^4*(a + b*x)^2) - (2*b*B^2*i*(c + d
*x)^3)/(27*(b*c - a*d)^2*g^4*(a + b*x)^3) + (B*d*i*(c + d*x)^2*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^2*g^4*(a + b*x)^2) - (2*b*B*i*(c +
 d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^2*g^4*(a + b*x
)^3) + (d*i*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a
*d)^2*g^4*(a + b*x)^2) - (b*i*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2)/(3*(b*c - a*d)^2*g^4*(a + b*x)^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(62c+62dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx = \int \left(\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^4(a+bx)^4} + \frac{62d\left(A+B\log\left(\frac{e}{}\right.\right.}{bg^4(a+bx}\right.$$

$$= \frac{(62d)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^3}\,dx}{bg^4} + \frac{(62(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{(a+bx)^4}}{bg^4}$$

$$= -\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2g^4(a+bx)^3} - \frac{31d\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{b^2g^4(a+bx)^2}$$

$$= -\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2g^4(a+bx)^3} - \frac{31d\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{b^2g^4(a+bx)^2}$$

$$= -\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2g^4(a+bx)^3} - \frac{31d\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{b^2g^4(a+bx)^2}$$

$$= -\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2g^4(a+bx)^3} - \frac{31d\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{b^2g^4(a+bx)^2}$$

$$= -\frac{124B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^2g^4(a+bx)^3} - \frac{31Bd\left(A+B\log\left(\right.\right.}{3b^2g^4(a+bx}$$

$$= -\frac{124B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^2g^4(a+bx)^3} - \frac{31Bd\left(A+B\log\left(\right.\right.}{3b^2g^4(a+bx}$$

$$= -\frac{124B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^2g^4(a+bx)^3} - \frac{31Bd\left(A+B\log\left(\right.\right.}{3b^2g^4(a+bx}$$

$$= -\frac{124B^2(bc-ad)}{27b^2g^4(a+bx)^3} + \frac{31B^2d}{18b^2g^4(a+bx)^2} + \frac{155B^2d^2}{9b^2(bc-ad)g^4(a+bx}$$

$$= -\frac{124B^2(bc-ad)}{27b^2g^4(a+bx)^3} + \frac{31B^2d}{18b^2g^4(a+bx)^2} + \frac{155B^2d^2}{9b^2(bc-ad)g^4(a+bx}$$

$$= -\frac{124B^2(bc-ad)}{27b^2g^4(a+bx)^3} + \frac{31B^2d}{18b^2g^4(a+bx)^2} + \frac{155B^2d^2}{9b^2(bc-ad)g^4(a+bx}$$

$$= -\frac{124B^2(bc-ad)}{27b^2g^4(a+bx)^3} + \frac{31B^2d}{18b^2g^4(a+bx)^2} + \frac{155B^2d^2}{9b^2(bc-ad)g^4(a+bx}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order

3 in optimal.
time = 0.69, size = 1035, normalized size = 3.61

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x)^4,x]
```

```
[Out] -1/108*(i*(36*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 54*d*(
b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 27*B*d*(a +
 b*x)*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c) +
 a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2*Lo
g[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A + B*
Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d
*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*
d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*
x)^2*Log[c + d*x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Lo
g[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
 - 2*B*d^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x]
)*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 2*B*(12*(b*c -
 a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x)
*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*L
og[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/
(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Lo
g[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d)^2 + 2
*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b
*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) +
6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a +
 b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] -
2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*
d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c +
 d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(b^2*(b*c
 - a*d)^2*g^4*(a + b*x)^3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 703 vs. $2(275) = 550$.
time = 0.62, size = 704, normalized size = 2.45 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/3*i*d^2*e^2/(a*d-b*c)^3/g^4*A^2*b/(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^3-1/2*i*d^3*e/(a*d-b*c)^3/g^4*A^2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^
```

```
2-2*i*d^2*e^2/(a*d-b*c)^3/g^4*A*B*b*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)+2*i*d^3
*e/(a*d-b*c)^3/g^4*A*B*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-i*d^2*e^2/(a*d-b*c)^
3/g^4*B^2*b*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^2-2/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)-2/27/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)+i*d^3*e/(a*d-b*c)^3/g^4*B^2*(-1/2/(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-1/2/(b*e/d
+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4/(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^2))
```

<u>Maxima</u> [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3286 vs. 2(273) = 546.
time = 0.58, size = 3286, normalized size = 11.45

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algor
ithm="maxima")
```

```
[Out] -1/6*I*(3*b*x + a)*B^2*d*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^4*x^
3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/54*I*(6*((6*b^2*d^
2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b
^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d
+ a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*
x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b
^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x
+ c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log(b*x
*e/(d*x + c) + a*e/(d*x + c)) + (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d
^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^
2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a
*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 5
4*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2
*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 3
3*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3
*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*
d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*
g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2
*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^
3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^
2*c - 1/108*I*(6*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d -
a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 -
2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4
*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*
```

```
b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x
 + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(
3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2
 - a^3*b^2*d^3)*g^4))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + (19*a*b^3*c^3
- 189*a^2*b^2*c^2*d + 189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - 32*a
*b^3*c*d^2 + 5*a^2*b^2*d^3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^
2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d
^2 - a^3*b*d^3)*x)*log(b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*
d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c
*d^2 - a^3*b*d^3)*x)*log(d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + 135*
a^2*b^2*c*d^2 - 19*a^3*b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c
*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^
2*b^2*c*d^2 - 5*a^3*b*d^3)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*d^3
+ (27*b^4*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2
 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b
^4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*
b^2*c*d^2 - a^3*b*d^3)*x)*log(b*x + a))*log(d*x + c))/(a^3*b^5*c^3*g^4 - 3*
a^4*b^4*c^2*d*g^4 + 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^4 -
3*a*b^7*c^2*d*g^4 + 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b^7*c
^3*g^4 - 3*a^2*b^6*c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x^2 +
 3*(a^2*b^6*c^3*g^4 - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b^3*d
^3*g^4)*x))*B^2*d - 1/18*I*A*B*d*(6*(3*b*x + a)*log(b*x*e/(d*x + c) + a*e/(
d*x + c))/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) +
 (5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 +
3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2
*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3
*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b
^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 -
 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3
)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g
^4)) - 1/9*I*A*B*c*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3
*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 +
3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^
3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*
g^4) + 6*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^
2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c
^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3
*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*I*B^2*c*log(b*x*e/(
d*x + c) + a*e/(d*x + c))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*
x + a^3*b*g^4) - 1/6*I*(3*b*x + a)*A^2*d/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3
*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*I*A^2*c/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2
+ 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 595 vs. $2(273) = 546$.

time = 0.41, size = 595, normalized size = 2.07

$$-\frac{4\,(9i\,A^2+6i\,AB+2i\,B^2)b^3c^3+27\,(-2i\,A^2-2i\,AB-i\,B^2)ab^2c^2d-(-18i\,A^2-30i\,AB-19i\,B^2)a^3d^3+6\,((-6i\,AB-5i\,B^2)b^3cd^2+(6i\,AB+5i\,B^2)ab^2d^3)x^2+18\,(-i\,B^2b^3d^3x^3-3i\,B^2ab^2d^3x^2+2i\,B^2b^3c^3-3i\,B^2ab^2c^2d+3\,(i\,B^2b^3c^2d-2i\,B^2ab^2cd^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)^2+3\,((18i\,A^2+6i\,AB-i\,B^2)b^3c^2d+18\,(-2i\,A^2-2i\,AB-i\,B^2)ab^2cd^2+(18i\,A^2+30i\,AB+19i\,B^2)a^2bd^3)x+6\,((-6i\,AB-5i\,B^2)b^3d^3x^3+4\,(3i\,AB+i\,B^2)b^3c^3+9\,(-2i\,AB-i\,B^2)ab^2c^2d+3\,(-2i\,B^2b^3cd^2+3\,(-2i\,AB-i\,B^2)ab^2d^3)x^2+3\,((6i\,AB+i\,B^2)b^3c^2d+6\,(-2i\,AB-i\,B^2)ab^2cd^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{108\,((b^7c^2-2\,ab^6cd+a^2b^5d^2)g^4x^3+3\,(ab^6c^2-2\,a^2b^5cd+a^3b^4d^2)g^4x^2+3\,(a^2b^5c^2-2\,a^3b^4cd+a^4b^3d^2)g^4x+(a^3b^4c^2-2\,a^4b^3cd+a^5b^2d^2)g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algor
ithm="fricas")
```

```
[Out] -1/108*(4*(9*I*A^2 + 6*I*A*B + 2*I*B^2)*b^3*c^3 + 27*(-2*I*A^2 - 2*I*A*B -
I*B^2)*a*b^2*c^2*d - (-18*I*A^2 - 30*I*A*B - 19*I*B^2)*a^3*d^3 + 6*((-6*I*A
*B - 5*I*B^2)*b^3*c*d^2 + (6*I*A*B + 5*I*B^2)*a*b^2*d^3)*x^2 + 18*(-I*B^2*b
^3*d^3*x^3 - 3*I*B^2*a*b^2*d^3*x^2 + 2*I*B^2*b^3*c^3 - 3*I*B^2*a*b^2*c^2*d
+ 3*(I*B^2*b^3*c^2*d - 2*I*B^2*a*b^2*c*d^2)*x)*log((b*x + a)*e/(d*x + c))^2
 + 3*((18*I*A^2 + 6*I*A*B - I*B^2)*b^3*c^2*d + 18*(-2*I*A^2 - 2*I*A*B - I*B
^2)*a*b^2*c*d^2 + (18*I*A^2 + 30*I*A*B + 19*I*B^2)*a^2*b*d^3)*x + 6*((-6*I*
A*B - 5*I*B^2)*b^3*d^3*x^3 + 4*(3*I*A*B + I*B^2)*b^3*c^3 + 9*(-2*I*A*B - I*
B^2)*a*b^2*c^2*d + 3*(-2*I*B^2*b^3*c*d^2 + 3*(-2*I*A*B - I*B^2)*a*b^2*d^3)*
x^2 + 3*((6*I*A*B + I*B^2)*b^3*c^2*d + 6*(-2*I*A*B - I*B^2)*a*b^2*c*d^2)*x)
*log((b*x + a)*e/(d*x + c)))/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3
 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2
*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*
d^2)*g^4)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 1387 vs. $2(267) = 534$.
time = 13.53, size = 1387, normalized size = 4.83

$$-\frac{Bd^3i(6A+5B)\log\left(x+\frac{6ABad^4i+6ABbcd^3i+5B^2ad^4i+5B^2bcd^3i-\frac{Ba^3d^6i(6A+5B)}{(ad-bc)^2}+\frac{3Ba^2bcd^5i(6A+5B)}{(ad-bc)^2}-\frac{3Bab^2c^2d^4i(6A+5B)}{(ad-bc)^2}+\frac{Bb^3c^3d^3i(6A+5B)}{(ad-bc)^2}}{12ABbd^4i+10B^2bd^4i}\right)}{18b^2g^4\,(ad-bc)^2}+\frac{Bd^3i(6A+5B)\log\left(x+\frac{6ABad^4i+6ABbcd^3i+5B^2ad^4i+5B^2bcd^3i+\frac{Ba^3d^6i(6A+5B)}{(ad-bc)^2}-\frac{3Ba^2bcd^5i(6A+5B)}{(ad-bc)^2}+\frac{3Bab^2c^2d^4i(6A+5B)}{(ad-bc)^2}-\frac{Bb^3c^3d^3i(6A+5B)}{(ad-bc)^2}}{12ABbd^4i+10B^2bd^4i}\right)}{18b^2g^4\,(ad-bc)^2}+\frac{(3B^2ac^2di+6B^2acd^2ix+3B^2ad^3ix^2-2B^2bc^3i-3B^2bc^2dix+B^2bd^3ix^3)\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{6a^5d^2g^4-12a^4bcdg^4+18a^4bd^2g^4x+6a^3b^2c^2g^4-36a^3b^2cdg^4x+18a^3b^2d^2g^4x^2+18a^2b^3c^2g^4x-36a^2b^3cdg^4x^2+6a^2b^3d^2g^4x^3+18ab^4c^2g^4x^2-12ab^4cdg^4x^3+6b^5c^2g^4x^3}+\frac{(-6ABa^2d^2i-6ABabcdi-18ABabd^2ix+12ABb^2c^2i+18ABb^2cdix-5B^2a^2d^2i-5B^2abcdi-15B^2abd^2ix+4B^2b^2c^2i+3B^2b^2cdix-6B^2b^2d^2ix^2)\log\left(\frac{e(a+bx)}{c+dx}\right)}{18a^4b^2dg^4-18a^3b^3cg^4+54a^3b^3dg^4x-54a^2b^4cg^4x+54a^2b^4dg^4x^2-54ab^5cg^4x^2+18ab^5dg^4x^3-18b^6cg^4x^3}+\frac{-18A^2a^2d^2i-18A^2abcdi+36A^2b^2c^2i-30ABa^2d^2i-30ABabcdi+24ABb^2c^2i-19B^2a^2d^2i-19B^2abcdi+8B^2b^2c^2i+x^2(-36ABb^2d^2i-30B^2b^2d^2i)+x(-54A^2abd^2i+54A^2b^2cdi-90ABabd^2i+18ABb^2cdi-57B^2abd^2i-3B^2b^2cdi)}{108a^4b^2dg^4-108a^3b^3cg^4+x^3\cdot(108ab^5dg^4-108b^6cg^4)+x^2\cdot(324a^2b^4dg^4-324ab^5cg^4)+x\,(324a^3b^3dg^4-324a^2b^4cg^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4,x)
```

```
[Out] -B*d**3*i*(6*A + 5*B)*log(x + (6*A*B*a*d**4*i + 6*A*B*b*c*d**3*i + 5*B**2*a
*d**4*i + 5*B**2*b*c*d**3*i - B*a**3*d**6*i*(6*A + 5*B)/(a*d - b*c)**2 + 3*
B*a**2*b*c*d**5*i*(6*A + 5*B)/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**4*i*(6*A
+ 5*B)/(a*d - b*c)**2 + B*b**3*c**3*d**3*i*(6*A + 5*B)/(a*d - b*c)**2)/(12*
A*B*b*d**4*i + 10*B**2*b*d**4*i))/(18*b**2*g**4*(a*d - b*c)**2) + B*d**3*i*
(6*A + 5*B)*log(x + (6*A*B*a*d**4*i + 6*A*B*b*c*d**3*i + 5*B**2*a*d**4*i +
5*B**2*b*c*d**3*i + B*a**3*d**6*i*(6*A + 5*B)/(a*d - b*c)**2 - 3*B*a**2*b*c
*d**5*i*(6*A + 5*B)/(a*d - b*c)**2 + 3*B*a*b**2*c**2*d**4*i*(6*A + 5*B)/(a*
d - b*c)**2 - B*b**3*c**3*d**3*i*(6*A + 5*B)/(a*d - b*c)**2)/(12*A*B*b*d**4
*i + 10*B**2*b*d**4*i))/(18*b**2*g**4*(a*d - b*c)**2) + (3*B**2*a*c**2*d*i
+ 6*B**2*a*c*d**2*i*x + 3*B**2*a*d**3*i*x**2 - 2*B**2*b*c**3*i - 3*B**2*b*c
**2*d*i*x + B**2*b*d**3*i*x**3)*log(e*(a + b*x)/(c + d*x))**2/(6*a**5*d**2*
g**4 - 12*a**4*b*c*d*g**4 + 18*a**4*b*d**2*g**4*x + 6*a**3*b**2*c**2*g**4 -
```

```
 36*a**3*b**2*c*d*g**4*x + 18*a**3*b**2*d**2*g**4*x**2 + 18*a**2*b**3*c**2*
g**4*x - 36*a**2*b**3*c*d*g**4*x**2 + 6*a**2*b**3*d**2*g**4*x**3 + 18*a*b**
4*c**2*g**4*x**2 - 12*a*b**4*c*d*g**4*x**3 + 6*b**5*c**2*g**4*x**3) + (-6*A
*B*a**2*d**2*i - 6*A*B*a*b*c*d*i - 18*A*B*a*b*d**2*i*x + 12*A*B*b**2*c**2*i
 + 18*A*B*b**2*c*d*i*x - 5*B**2*a**2*d**2*i - 5*B**2*a*b*c*d*i - 15*B**2*a*
b*d**2*i*x + 4*B**2*b**2*c**2*i + 3*B**2*b**2*c*d*i*x - 6*B**2*b**2*d**2*i*
x**2)*log(e*(a + b*x)/(c + d*x))/(18*a**4*b**2*d*g**4 - 18*a**3*b**3*c*g**4
 + 54*a**3*b**3*d*g**4*x - 54*a**2*b**4*c*g**4*x + 54*a**2*b**4*d*g**4*x**2
 - 54*a*b**5*c*g**4*x**2 + 18*a*b**5*d*g**4*x**3 - 18*b**6*c*g**4*x**3) + (
-18*A**2*a**2*d**2*i - 18*A**2*a*b*c*d*i + 36*A**2*b**2*c**2*i - 30*A*B*a**
2*d**2*i - 30*A*B*a*b*c*d*i + 24*A*B*b**2*c**2*i - 19*B**2*a**2*d**2*i - 19
*B**2*a*b*c*d*i + 8*B**2*b**2*c**2*i + x**2*(-36*A*B*b**2*d**2*i - 30*B**2*
b**2*d**2*i) + x*(-54*A**2*a*b*d**2*i + 54*A**2*b**2*c*d*i - 90*A*B*a*b*d**
2*i + 18*A*B*b**2*c*d*i - 57*B**2*a*b*d**2*i - 3*B**2*b**2*c*d*i))/(108*a**
4*b**2*d*g**4 - 108*a**3*b**3*c*g**4 + x**3*(108*a*b**5*d*g**4 - 108*b**6*c
*g**4) + x**2*(324*a**2*b**4*d*g**4 - 324*a*b**5*c*g**4) + x*(324*a**3*b**3
*d*g**4 - 324*a**2*b**4*c*g**4))
```

Giac [A]

time = 2.58, size = 425, normalized size = 1.48

$$-\frac{\left(36i\,B^2be^4\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{54i\,(bxe+ae)B^2de^3\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+72i\,ABbe^4\log\left(\frac{bxe+ae}{dx+c}\right)+24i\,B^2be^4\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{108i\,(bxe+ae)ABde^3\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{54i\,(bxe+ae)B^2de^3\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+36i\,A^2be^4+24i\,ABbe^4+8i\,B^2be^4-\frac{54i\,(bxe+ae)A^2de^3}{dx+c}-\frac{54i\,(bxe+ae)ABde^3}{dx+c}-\frac{27i\,(bxe+ae)B^2de^3}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{108\left(\frac{(bxe+ae)^3bcg^4}{(dx+c)^3}-\frac{(bxe+ae)^3adg^4}{(dx+c)^3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algor
ithm="giac")
```

```
[Out] -1/108*(36*I*B^2*b*e^4*log((b*x*e + a*e)/(d*x + c))^2 - 54*I*(b*x*e + a*e)*
B^2*d*e^3*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 72*I*A*B*b*e^4*log((b*
x*e + a*e)/(d*x + c)) + 24*I*B^2*b*e^4*log((b*x*e + a*e)/(d*x + c)) - 108*I
*(b*x*e + a*e)*A*B*d*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 54*I*(b*x
*e + a*e)*B^2*d*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 36*I*A^2*b*e^4
 + 24*I*A*B*b*e^4 + 8*I*B^2*b*e^4 - 54*I*(b*x*e + a*e)*A^2*d*e^3/(d*x + c)
- 54*I*(b*x*e + a*e)*A*B*d*e^3/(d*x + c) - 27*I*(b*x*e + a*e)*B^2*d*e^3/(d*
x + c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*
d)))/((b*x*e + a*e)^3*b*c*g^4/(d*x + c)^3 - (b*x*e + a*e)^3*a*d*g^4/(d*x +
c)^3)
```

Mupad [B]

time = 7.70, size = 955, normalized size = 3.33

$$-\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2\left(\frac{\frac{B^2\,c\,i}{3\,b^2\,g^4}+\frac{B^2\,a\,d\,i}{6\,b^3\,g^4}+\frac{B^2\,d\,i\,x}{2\,b^2\,g^4}}{3\,a^2\,x+\frac{a^3}{b}+b^2\,x^3+3\,a\,b\,x^2}-\frac{B^2\,d^3\,i}{6\,b^2\,g^4\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}\right)-\frac{\frac{18\,i\,A^2\,a^2\,d^2+18\,i\,A^2\,a\,b\,c\,d-36\,i\,A^2\,b^2\,c^2+30\,i\,A\,B\,a^2\,d^2+30\,i\,A\,B\,a\,b\,c\,d-24\,i\,A\,B\,b^2\,c^2+19\,i\,B^2\,a^2\,d^2+19\,i\,B^2\,a\,b\,c\,d-8\,i\,B^2\,b^2\,c^2}{6\,(a\,d-b\,c)}+\frac{x^2\,(5\,i\,B^2\,b^2\,d^2+6\,A\,i\,B\,b^2\,d^2)}{a\,d-b\,c}+\frac{x\,(-18\,c\,i\,A^2\,b^2\,d+18\,a\,i\,A^2\,b\,d^2-6\,c\,i\,A\,B\,b^2\,d+30\,a\,i\,A\,B\,b\,d^2+c\,i\,B^2\,b^2\,d+19\,a\,i\,B^2\,b\,d^2)}{2\,(a\,d-b\,c)}}{18\,a^3\,b^2\,g^4+54\,a^2\,b^3\,g^4\,x+54\,a\,b^4\,g^4\,x^2+18\,b^5\,g^4\,x^3}-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\left(x\left(\frac{A\,B\,i}{b^2\,g^4}+\frac{B^2\,d^3\,i\,\left(b\,\left(\text{[illegible]}\right)\right)}{3\,b^2\,g^4\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}\right)+\frac{A\,B\,a\,i}{3\,b^3\,g^4}+\frac{B\,i\,(2\,A\,b\,c-B\,a\,d+B\,b\,c)}{3\,b^3\,d\,g^4}+\frac{B^2\,d^3\,i\,\left(a\,\left(\text{[illegible]}\right)\right)}{3\,b^3\,g^4\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}-\frac{B^2\,d^3\,i\,x^2\,\left(\text{[illegible]}\right)}{3\,b^2\,g^4\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}\right)}{\frac{3\,a^2\,x}{d}+\frac{a^3}{b\,d}+\frac{b^2\,x^3}{d}+\frac{3\,a\,b\,x^2}{d}}-\frac{B\,d^3\,i\,\mathrm{atan}\left(\frac{\left(2\,b\,d\,x-\frac{18\,b^4\,c^2\,g^4-18\,a^2\,b^2\,d^2\,g^4}{18\,b^3\,g^4\,(a\,d-b\,c)}\right)\,1i}{a\,d-b\,c}\right)\,(6\,A+5\,B)\,1i}{9\,b^2\,g^4\,(a\,d-b\,c)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^4,
x)
```

```
[Out] - log((e*(a + b*x))/(c + d*x))^2*(((B^2*c*i)/(3*b^2*g^4) + (B^2*a*d*i)/(6*b
^3*g^4) + (B^2*d*i*x)/(2*b^2*g^4))/(3*a^2*x + a^3/b + b^2*x^3 + 3*a*b*x^2)
- (B^2*d^3*i)/(6*b^2*g^4*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - ((18*A^2*a^2*d
^2*i - 36*A^2*b^2*c^2*i + 19*B^2*a^2*d^2*i - 8*B^2*b^2*c^2*i + 30*A*B*a^2*d
^2*i - 24*A*B*b^2*c^2*i + 18*A^2*a*b*c*d*i + 19*B^2*a*b*c*d*i + 30*A*B*a*b*
c*d*i)/(6*(a*d - b*c)) + (x^2*(5*B^2*b^2*d^2*i + 6*A*B*b^2*d^2*i))/(a*d - b
*c) + (x*(18*A^2*a*b*d^2*i + 19*B^2*a*b*d^2*i - 18*A^2*b^2*c*d*i + B^2*b^2*
c*d*i + 30*A*B*a*b*d^2*i - 6*A*B*b^2*c*d*i))/(2*(a*d - b*c)))/(18*a^3*b^2*g
^4 + 18*b^5*g^4*x^3 + 54*a^2*b^3*g^4*x + 54*a*b^4*g^4*x^2) - (log((e*(a + b
*x))/(c + d*x))*(x*((A*B*i)/(b^2*g^4) + (B^2*d^3*i*(b*((3*a^2*d^2 + b^2*c^2
 - 4*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(3*b*d^2)) + (3*a^2*d^2 + b^2*c^2
 - 4*a*b*c*d)/(3*d^3) + (2*a*(a*d - b*c))/(3*d^2)))/(3*b^2*g^4*(a^2*d^2 + b
^2*c^2 - 2*a*b*c*d))) + (A*B*a*i)/(3*b^3*g^4) + (B*i*(2*A*b*c - B*a*d + B*b
*c))/(3*b^3*d*g^4) + (B^2*d^3*i*(a*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(6*b*
d^3) + (a*(a*d - b*c))/(3*b*d^2)) + (3*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d -
6*a^2*b*c*d^2)/(3*b*d^4)))/(3*b^2*g^4*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (B
^2*d^3*i*x^2*((b^2*c - a*b*d)/(3*d^2) - (2*b*(a*d - b*c))/(3*d^2)))/(3*b^2*
g^4*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))))/((3*a^2*x)/d + a^3/(b*d) + (b^2*x^3)
/d + (3*a*b*x^2)/d) - (B*d^3*i*atan(((2*b*d*x - (18*b^4*c^2*g^4 - 18*a^2*b^
2*d^2*g^4)/(18*b^2*g^4*(a*d - b*c)))*1i)/(a*d - b*c))*(6*A + 5*B)*1i)/(9*b^
2*g^4*(a*d - b*c)^2)
```

3.63 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=445

$$-\frac{B^2d^2i(c+dx)^2}{4(bc-ad)^3g^5(a+bx)^2}+\frac{4bB^2di(c+dx)^3}{27(bc-ad)^3g^5(a+bx)^3}-\frac{b^2B^2i(c+dx)^4}{32(bc-ad)^3g^5(a+bx)^4}-\frac{Bd^2i(c+dx)^2\left(A+B\log\left(\right.\right.}{2(bc-ad)^3g^5(a+b}$$

```
[Out] -1/4*B^2*d^2*i*(d*x+c)^2/(-a*d+b*c)^3/g^5/(b*x+a)^2+4/27*b*B^2*d*i*(d*x+c)^
3/(-a*d+b*c)^3/g^5/(b*x+a)^3-1/32*b^2*B^2*i*(d*x+c)^4/(-a*d+b*c)^3/g^5/(b*x
+a)^4-1/2*B*d^2*i*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^5/(b
*x+a)^2+4/9*b*B*d*i*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^5/
(b*x+a)^3-1/8*b^2*B*i*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^
5/(b*x+a)^4-1/2*d^2*i*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3/
g^5/(b*x+a)^2+2/3*b*d*i*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^
3/g^5/(b*x+a)^3-1/4*b^2*i*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c
)^3/g^5/(b*x+a)^4
```

Rubi [A]
time = 0.24, antiderivative size = 445, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2562, 2395, 2342, 2341}

$$-\frac{b^2i(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^3}-\frac{b^2Bi(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^3}-\frac{d^2i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^5(a+bx)^2(bc-ad)^3}-\frac{Bd^2i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^5(a+bx)^2(bc-ad)^3}+\frac{2bdi(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^5(a+bx)^3(bc-ad)^3}+\frac{4bBdi(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^5(a+bx)^3(bc-ad)^3}-\frac{b^2B^2i(c+dx)^4}{32g^5(a+bx)^4(bc-ad)^3}-\frac{B^2d^2i(c+dx)^2}{4g^5(a+bx)^2(bc-ad)^3}+\frac{4bB^2di(c+dx)^3}{27g^5(a+bx)^3(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^5,
x]
```

```
[Out] -1/4*(B^2*d^2*i*(c + d*x)^2)/((b*c - a*d)^3*g^5*(a + b*x)^2) + (4*b*B^2*d*i
*(c + d*x)^3)/(27*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*B^2*i*(c + d*x)^4)/
(32*(b*c - a*d)^3*g^5*(a + b*x)^4) - (B*d^2*i*(c + d*x)^2*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (4*b*B*d*i*(c + d*
x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^3*g^5*(a + b*x)^3
) - (b^2*B*i*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*
d)^3*g^5*(a + b*x)^4) - (d^2*i*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*
x)])^2)/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*d*i*(c + d*x)^3*(A + B*Log
[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*i*(c
 + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*(b*c - a*d)^3*g^5*(a +
 b*x)^4)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
```

```
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(63c+63dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx=\int\left(\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^5(a+bx)^5}+\frac{63d\left(A+B\log\left(\right.\right.}{bg^5(a+b}\right.$$

$$=\frac{(63d)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^4}\,dx}{bg^5}+\frac{(63(bc-ad))\int\frac{\left(A+B\log\left(\frac{e(a+b}{c+dx}\right.\right.}{(a+bx)^5}}{bg^5}$$

$$=-\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2g^5(a+bx)^4}-\frac{21d\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{b^2g^5(a+bx)^3}$$

$$=-\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2g^5(a+bx)^4}-\frac{21d\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{b^2g^5(a+bx)^3}$$

$$=-\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2g^5(a+bx)^4}-\frac{21d\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{b^2g^5(a+bx)^3}$$

$$=-\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2g^5(a+bx)^4}-\frac{21d\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{b^2g^5(a+bx)^3}$$

$$=-\frac{63B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^2g^5(a+bx)^4}-\frac{7Bd\left(A+B\log\left(\frac{e}{}\right.\right.}{2b^2g^5(a+bx}$$

$$=-\frac{63B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^2g^5(a+bx)^4}-\frac{7Bd\left(A+B\log\left(\frac{e}{}\right.\right.}{2b^2g^5(a+bx}$$

$$=-\frac{63B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^2g^5(a+bx)^4}-\frac{7Bd\left(A+B\log\left(\frac{e}{}\right.\right.}{2b^2g^5(a+bx}$$

$$=-\frac{63B^2(bc-ad)}{32b^2g^5(a+bx)^4}+\frac{35B^2d}{24b^2g^5(a+bx)^3}+\frac{7B^2d^2}{16b^2(bc-ad)g^5(a+}$$

$$=-\frac{63B^2(bc-ad)}{32b^2g^5(a+bx)^4}+\frac{35B^2d}{24b^2g^5(a+bx)^3}+\frac{7B^2d^2}{16b^2(bc-ad)g^5(a+}$$

$$=-\frac{63B^2(bc-ad)}{32b^2g^5(a+bx)^4}+\frac{35B^2d}{24b^2g^5(a+bx)^3}+\frac{7B^2d^2}{16b^2(bc-ad)g^5(a+}$$

$$=-\frac{63B^2(bc-ad)}{32b^2g^5(a+bx)^4}+\frac{35B^2d}{24b^2g^5(a+bx)^3}+\frac{7B^2d^2}{16b^2(bc-ad)g^5(a+}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order

3 in optimal.
time = 1.00, size = 1340, normalized size = 3.01

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x)^5,x]
```

```
[Out] -1/864*(i*(216*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 288*d
*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 16*B*d
*(a + b*x)*(12*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b
*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c -
a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*
Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c -
 a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*
x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a
+ b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c
- a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[
a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a +
b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b
*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])) + 3*B*(36*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 48
*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 72*d^2
*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^3*(
-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 144*d^4*(a
 + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^4*(a +
b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 144*B*d^3*(a + b
*x)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 3
6*B*d^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(
a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*(a + b*x)
*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*
x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3
*B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*
(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a
+ b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*(a + b*x)^4*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) - 72*B*d^4*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*
c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c -
 a*d)]))))/(b^2*(b*c - a*d)^3*g^5*(a + b*x)^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1057 vs. $2(427) = 854$.
time = 0.77, size = 1058, normalized size = 2.38 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/4*i*d^2*e^3/(a*d-b*c)^4/g^5*A^2*b^2/(b*e/d+(a*d-b*c)
*e/d/(d*x+c))^4+2/3*i*d^3*e^2/(a*d-b*c)^4/g^5*A^2*b/(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^3-1/2*i*d^4*e/(a*d-b*c)^4/g^5*A^2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+2*
i*d^2*e^3/(a*d-b*c)^4/g^5*A*B*b^2*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/16/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4)-4*i*d^3*
e^2/(a*d-b*c)^4/g^5*A*B*b*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))-1/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)+2*i*d^4*e/(a*d-b*
c)^4/g^5*A*B*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)+i*d^2*e^3/(a*d-b*c)^4/g^5*B^2*
b^2*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2
-1/8/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/32/(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^4)-2*i*d^3*e^2/(a*d-b*c)^4/g^5*B^2*b*(-1/3/(b*
e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2/9/(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2/27/(b*e/d+(a*d-b*
c)*e/d/(d*x+c))^3)+i*d^4*e/(a*d-b*c)^4/g^5*B^2*(-1/2/(b*e/d+(a*d-b*c)*e/d/(
d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c
))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 4812 vs. $2(424) = 848$.
time = 0.80, size = 4812, normalized size = 10.81

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algor
ithm="maxima")
```

```
[Out] -1/12*I*(4*b*x + a)*B^2*d*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^5*x
^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) +
 1/288*I*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2
 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*
d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^
5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4
*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^
3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b
^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^
3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2
 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*
b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b*x*
e/(d*x + c) + a*e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^
```

```
2*d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6
*(13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4
 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x +
 a)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4
*x + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*
b^2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b
^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 1
00*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*
(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^
4)*log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a
^6*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4
*a*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^
4*g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5
 - 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*
b^6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g
^5)*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5
- 4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2*c - 1/864*I*(12*((7*a*b^3*
c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*
b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*
b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 -
3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a
^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*
a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3
*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^
5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*
log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^
3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a
*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5))*log(b
*x*e/(d*x + c) + a*e/(d*x + c)) + (37*a*b^4*c^4 - 304*a^2*b^3*c^3*d + 1512*
a^3*b^2*c^2*d^2 - 1360*a^4*b*c*d^3 + 115*a^5*d^4 + 12*(88*b^5*c^2*d^2 - 101
*a*b^4*c*d^3 + 13*a^2*b^3*d^4)*x^3 - 6*(40*b^5*c^3*d - 609*a*b^4*c^2*d^2 +
648*a^2*b^3*c*d^3 - 79*a^3*b^2*d^4)*x^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*
b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2
*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(b*x
+ a)^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4
*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4
*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(d*x + c)^2 + 4*(16*b^5*c^4 - 163*a*b^
4*c^3*d + 1068*a^2*b^3*c^2*d^2 - 1036*a^3*b^2*c*d^3 + 115*a^4*b*d^4)*x + 12
*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4 + 4*(88*a
*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4)*x^
2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x)*log(b*x + a) - 12*(88*a^4*b*c*d^
3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 - 13
*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^3*b
^2*c*d^3 - 13*a^4*b*d^4)*x - 12*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a
*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 -
```

```
a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(b*x + a))*log(d*x
 + c))/(a^4*b^6*c^4*g^5 - 4*a^5*b^5*c^3*d*g^5 + 6*a^6*b^4*c^2*d^2*g^5 - 4*a
^7*b^3*c*d^3*g^5 + a^8*b^2*d^4*g^5 + (b^10*c^4*g^5 - 4*a*b^9*c^3*d*g^5 + 6*
a^2*b^8*c^2*d^2*g^5 - 4*a^3*b^7*c*d^3*g^5 + a^4*b^6*d^4*g^5)*x^4 + 4*(a*b^9
*c^4*g^5 - 4*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7*c^2*d^2*g^5 - 4*a^4*b^6*c*d^3*g^
5 + a^5*b^5*d^4*g^5)*x^3 + 6*(a^2*b^8*c^4*g^5 - 4*a^3*b^7*c^3*d*g^5 + 6*a^4
*b^6*c^2*d^2*g^5 - 4*a^5*b^5*c*d^3*g^5 + a^6*b^4*d^4*g^5)*x^2 + 4*(a^3*b^7*
c^4*g^5 - 4*a^4*b^6*c^3*d*g^5 + 6*a^5*b^5*c^2*d^2*g^5 - 4*a^6*b^4*c*d^3*g^5
 + a^7*b^3*d^4*g^5)*x))*B^2*d - 1/72*I*A*B*d*(1...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 986 vs. $2(424) = 848$.
time = 0.44, size = 986, normalized size = 2.22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algor
ithm="fricas")
```

```
[Out] 1/864*(27*(-8*I*A^2 - 4*I*A*B - I*B^2)*b^4*c^4 + 64*(9*I*A^2 + 6*I*A*B + 2*
I*B^2)*a*b^3*c^3*d + 216*(-2*I*A^2 - 2*I*A*B - I*B^2)*a^2*b^2*c^2*d^2 - (-7
2*I*A^2 - 156*I*A*B - 115*I*B^2)*a^4*d^4 + 12*((-12*I*A*B - 13*I*B^2)*b^4*c
*d^3 + (12*I*A*B + 13*I*B^2)*a*b^3*d^4)*x^3 + 6*((12*I*A*B + I*B^2)*b^4*c^2
*d^2 + 16*(-6*I*A*B - 5*I*B^2)*a*b^3*c*d^3 + (84*I*A*B + 79*I*B^2)*a^2*b^2*
d^4)*x^2 + 72*(-I*B^2*b^4*d^4*x^4 - 4*I*B^2*a*b^3*d^4*x^3 - 6*I*B^2*a^2*b^2
*d^4*x^2 - 3*I*B^2*b^4*c^4 + 8*I*B^2*a*b^3*c^3*d - 6*I*B^2*a^2*b^2*c^2*d^2
+ 4*(-I*B^2*b^4*c^3*d + 3*I*B^2*a*b^3*c^2*d^2 - 3*I*B^2*a^2*b^2*c*d^3)*x)*l
og((b*x + a)*e/(d*x + c))^2 + 4*((-72*I*A^2 - 12*I*A*B + 5*I*B^2)*b^4*c^3*d
 + 12*(18*I*A^2 + 6*I*A*B - I*B^2)*a*b^3*c^2*d^2 + 108*(-2*I*A^2 - 2*I*A*B
- I*B^2)*a^2*b^2*c*d^3 + (72*I*A^2 + 156*I*A*B + 115*I*B^2)*a^3*b*d^4)*x +
12*((-12*I*A*B - 13*I*B^2)*b^4*d^4*x^4 + 9*(-4*I*A*B - I*B^2)*b^4*c^4 + 32*
(3*I*A*B + I*B^2)*a*b^3*c^3*d + 36*(-2*I*A*B - I*B^2)*a^2*b^2*c^2*d^2 + 4*(
-3*I*B^2*b^4*c*d^3 + 2*(-6*I*A*B - 5*I*B^2)*a*b^3*d^4)*x^3 + 6*(I*B^2*b^4*c
^2*d^2 - 8*I*B^2*a*b^3*c*d^3 + 6*(-2*I*A*B - I*B^2)*a^2*b^2*d^4)*x^2 + 4*((
-12*I*A*B - I*B^2)*b^4*c^3*d + 6*(6*I*A*B + I*B^2)*a*b^3*c^2*d^2 + 18*(-2*I
*A*B - I*B^2)*a^2*b^2*c*d^3)*x)*log((b*x + a)*e/(d*x + c)))/((b^9*c^3 - 3*a
*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*
b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3
*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^
4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b
^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.44, size = 709, normalized size = 1.59

$$\frac{\left(-216i B^2b^2e^5\log\left(\frac{bxe+ae}{dx+c}\right)^2 + \frac{576i(bxe+ae)B^2bde^4\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c} - \frac{432i(bxe+ae)^2B^2d^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)^2}{(dx+c)^2} - 432iABb^2e^5\log\left(\frac{bxe+ae}{dx+c}\right) - 108iB^2b^2e^5\log\left(\frac{bxe+ae}{dx+c}\right) + \frac{1152i(bxe+ae)ABbde^4\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c} + \frac{384i(bxe+ae)B^2bde^4\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c} - \frac{864i(bxe+ae)^2ABd^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2} - \frac{432i(bxe+ae)^2B^2d^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2} - 216iA^2b^2e^5 - 108iABb^2e^5 - 27iB^2b^2e^5 + \frac{576i(bxe+ae)A^2bde^4}{dx+c} + \frac{384i(bxe+ae)ABbde^4}{dx+c} + \frac{128i(bxe+ae)B^2bde^4}{dx+c} - \frac{432i(bxe+ae)^2A^2d^2e^3}{(dx+c)^2} - \frac{432i(bxe+ae)^2ABd^2e^3}{(dx+c)^2} - \frac{216i(bxe+ae)^2B^2d^2e^3}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)} - \frac{ad}{(bce-ade)(bc-ad)}\right)}{864\left(\frac{(bxe+ae)^4b^2c^2g^5}{(dx+c)^4} - \frac{2(bxe+ae)^4abcdg^5}{(dx+c)^4} + \frac{(bxe+ae)^4a^2d^2g^5}{(dx+c)^4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algor
ithm="giac")
```

```
[Out] 1/864*(-216*I*B^2*b^2*e^5*log((b*x*e + a*e)/(d*x + c))^2 + 576*I*(b*x*e + a
*e)*B^2*b*d*e^4*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) - 432*I*(b*x*e + a
*e)^2*B^2*d^2*e^3*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^2 - 432*I*A*B*b^
2*e^5*log((b*x*e + a*e)/(d*x + c)) - 108*I*B^2*b^2*e^5*log((b*x*e + a*e)/(d
*x + c)) + 1152*I*(b*x*e + a*e)*A*B*b*d*e^4*log((b*x*e + a*e)/(d*x + c))/(d
*x + c) + 384*I*(b*x*e + a*e)*B^2*b*d*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x
 + c) - 864*I*(b*x*e + a*e)^2*A*B*d^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x
 + c)^2 - 432*I*(b*x*e + a*e)^2*B^2*d^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d
*x + c)^2 - 216*I*A^2*b^2*e^5 - 108*I*A*B*b^2*e^5 - 27*I*B^2*b^2*e^5 + 576*
I*(b*x*e + a*e)*A^2*b*d*e^4/(d*x + c) + 384*I*(b*x*e + a*e)*A*B*b*d*e^4/(d*
x + c) + 128*I*(b*x*e + a*e)*B^2*b*d*e^4/(d*x + c) - 432*I*(b*x*e + a*e)^2*
A^2*d^2*e^3/(d*x + c)^2 - 432*I*(b*x*e + a*e)^2*A*B*d^2*e^3/(d*x + c)^2 - 2
16*I*(b*x*e + a*e)^2*B^2*d^2*e^3/(d*x + c)^2)*(b*c/((b*c*e - a*d*e)*(b*c -
a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^4*b^2*c^2*g^5/(d*
x + c)^4 - 2*(b*x*e + a*e)^4*a*b*c*d*g^5/(d*x + c)^4 + (b*x*e + a*e)^4*a^2*
d^2*g^5/(d*x + c)^4)
```

Mupad [B]
time = 10.82, size = 1870, normalized size = 4.20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^5,
x)
```

```
[Out] ((72*A^2*a^3*d^3*i + 216*A^2*b^3*c^3*i + 115*B^2*a^3*d^3*i + 27*B^2*b^3*c^3
*i + 156*A*B*a^3*d^3*i + 108*A*B*b^3*c^3*i - 360*A^2*a*b^2*c^2*d*i + 72*A^2
*a^2*b*c*d^2*i - 101*B^2*a*b^2*c^2*d*i + 115*B^2*a^2*b*c*d^2*i - 276*A*B*a*
b^2*c^2*d*i + 156*A*B*a^2*b*c*d^2*i)/(12*(a*d - b*c)) + (x^2*(79*B^2*a*b^2*
d^3*i - B^2*b^3*c*d^2*i + 84*A*B*a*b^2*d^3*i - 12*A*B*b^3*c*d^2*i))/(2*(a*d
```

```
 - b*c)) + (x*(72*A^2*a^2*b*d^3*i + 115*B^2*a^2*b*d^3*i + 72*A^2*b^3*c^2*d*
i - 5*B^2*b^3*c^2*d*i + 156*A*B*a^2*b*d^3*i + 12*A*B*b^3*c^2*d*i - 144*A^2*
a*b^2*c*d^2*i + 7*B^2*a*b^2*c*d^2*i - 60*A*B*a*b^2*c*d^2*i))/(3*(a*d - b*c)
) + (d*x^3*(13*B^2*b^3*d^2*i + 12*A*B*b^3*d^2*i))/(a*d - b*c))/(x*(288*a^3*
b^4*c*g^5 - 288*a^4*b^3*d*g^5) - x^3*(288*a^2*b^5*d*g^5 - 288*a*b^6*c*g^5)
+ x^4*(72*b^7*c*g^5 - 72*a*b^6*d*g^5) + x^2*(432*a^2*b^5*c*g^5 - 432*a^3*b^
4*d*g^5) + 72*a^4*b^3*c*g^5 - 72*a^5*b^2*d*g^5) - log((e*(a + b*x))/(c + d*
x))^2*(((B^2*c*i)/(4*b^2*g^5) + (B^2*a*d*i)/(12*b^3*g^5) + (B^2*d*i*x)/(3*b
^2*g^5))/(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 + 4*a*b^2*x^3) - (B^2*d^4
*i)/(12*b^2*g^5*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) - (lo
g((e*(a + b*x))/(c + d*x))*(x*((2*A*B*i)/(3*b^2*g^5) + (B^2*d^4*i*(b*(a*((4
*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) + (
6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(12*b*d^4)) + a*(b*((
4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) +
(4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(6*d^3) + (a*(a*d - b*c))/(2*d^2)) + (6*a
^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(4*d^4)))/(6*b^2*g^5*(a^
3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) + (A*B*a*i)/(6*b^3*g^5)
+ (B*i*(3*A*b*c - B*a*d + B*b*c))/(6*b^3*d*g^5) + (B^2*d^4*i*(a*(a*((4*a^2*
d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) + (6*a^3
*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(12*b*d^4)) + (4*a^4*d^4 +
 b^4*c^4 + 10*a^2*b^2*c^2*d^2 - 5*a*b^3*c^3*d - 10*a^3*b*c*d^3)/(4*b*d^5)))
/(6*b^2*g^5*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (B^2*d^4
*i*x^2*(b*(b*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c)
)/(4*b*d^2)) + (4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(6*d^3) + (a*(a*d - b*c))/
(2*d^2)) - a*((b^2*c - a*b*d)/(4*d^2) - (b*(a*d - b*c))/(2*d^2)) + (b^3*c^2
 + 4*a^2*b*d^2 - 5*a*b^2*c*d)/(4*d^3)))/(6*b^2*g^5*(a^3*d^3 - b^3*c^3 + 3*a
*b^2*c^2*d - 3*a^2*b*c*d^2)) - (B^2*d^4*i*x^3*(b*((b^2*c - a*b*d)/(4*d^2) -
 (b*(a*d - b*c))/(2*d^2)) + (b^3*c - a*b^2*d)/(4*d^2)))/(6*b^2*g^5*(a^3*d^3
 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))))/((4*a^3*x)/d + a^4/(b*d) + (
b^3*x^4)/d + (6*a^2*b*x^2)/d + (4*a*b^2*x^3)/d) - (B*d^4*i*atan((B*d^4*i*(1
2*A + 13*B)*(72*b^5*c^3*g^5 + 72*a^3*b^2*d^3*g^5 - 72*a*b^4*c^2*d*g^5 - 72*
a^2*b^3*c*d^2*g^5)*1i)/(72*b^2*g^5*(13*B^2*d^4*i + 12*A*B*d^4*i)*(a*d - b*c
)^3) + (B*d^5*i*x*(12*A + 13*B)*(b^4*c^2*g^5 + a^2*b^2*d^2*g^5 - 2*a*b^3*c*
d*g^5)*2i)/(b*g^5*(13*B^2*d^4*i + 12*A*B*d^4*i)*(a*d - b*c)^3))*(12*A + 13*
B)*1i)/(36*b^2*g^5*(a*d - b*c)^3)
```

3.64 $\int (ag+bgx)^3(ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=711

$$\frac{3B^2(bc-ad)^5g^3i^2x}{20b^2d^3}+\frac{B^2(bc-ad)^2g^3i^2(a+bx)^4}{60b^3}-\frac{3B^2(bc-ad)^4g^3i^2(c+dx)^2}{40bd^4}+\frac{B^2(bc-ad)^3g^3i^2(c+dx)^3}{60d^4}-$$

```
[Out] 3/20*B^2*(-a*d+b*c)^5*g^3*i^2*x/b^2/d^3+1/60*B^2*(-a*d+b*c)^2*g^3*i^2*(b*x+
a)^4/b^3-3/40*B^2*(-a*d+b*c)^4*g^3*i^2*(d*x+c)^2/b/d^4+1/60*B^2*(-a*d+b*c)^
3*g^3*i^2*(d*x+c)^3/d^4-1/90*B*(-a*d+b*c)^3*g^3*i^2*(b*x+a)^3*(A+B*ln(e*(b*
x+a)/(d*x+c)))/b^3/d-1/20*B*(-a*d+b*c)^2*g^3*i^2*(b*x+a)^4*(A+B*ln(e*(b*x+a
)/(d*x+c)))/b^3-1/15*B*(-a*d+b*c)*g^3*i^2*(b*x+a)^4*(d*x+c)*(A+B*ln(e*(b*x+
a)/(d*x+c)))/b^2+1/60*(-a*d+b*c)^2*g^3*i^2*(b*x+a)^4*(A+B*ln(e*(b*x+a)/(d*x
+c)))^2/b^3+1/15*(-a*d+b*c)*g^3*i^2*(b*x+a)^4*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*
x+c)))^2/b^2+1/6*g^3*i^2*(b*x+a)^4*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/
b+1/180*B*(-a*d+b*c)^4*g^3*i^2*(b*x+a)^2*(3*A+B+3*B*ln(e*(b*x+a)/(d*x+c)))/
b^3/d^2-1/180*B*(-a*d+b*c)^5*g^3*i^2*(b*x+a)*(6*A+5*B+6*B*ln(e*(b*x+a)/(d*x
+c)))/b^3/d^3-1/180*B*(-a*d+b*c)^6*g^3*i^2*ln((-a*d+b*c)/b/(d*x+c))*(6*A+11
*B+6*B*ln(e*(b*x+a)/(d*x+c)))/b^3/d^4-1/20*B^2*(-a*d+b*c)^6*g^3*i^2*ln(d*x+
c)/b^3/d^4-1/30*B^2*(-a*d+b*c)^6*g^3*i^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^3
/d^4
```

Rubi [A]
time = 0.67, antiderivative size = 711, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 13, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {2562, 2383, 2381, 2384, 2354, 2438, 2373, 45, 47, 37, 2382, 12, 79}

$$-\frac{B^2g^3i^2(bc-ad)^6\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{30b^3d^4}-\frac{Bg^3i^2(bc-ad)^6\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+11B\right)}{180b^3d^4}-\frac{Bg^3i^2(a+bx)(bc-ad)^5\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+5B\right)}{180b^3d^3}+\frac{Bg^3i^2(a+bx)^2(bc-ad)^4\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right)+3A+B\right)}{180b^3d^2}-\frac{Bg^3i^2(a+bx)^3(bc-ad)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{90b^3d}+\frac{g^3i^2(a+bx)^4(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{60b^3}-\frac{Bg^3i^2(a+bx)^4(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{20b^3}+\frac{g^3i^2(a+bx)^4(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{15b^2}-\frac{Bg^3i^2(a+bx)^4(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{15b^2}+\frac{g^3i^2(a+bx)^4(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{6b}-\frac{B^2g^3i^2(bc-ad)^6\log(c+dx)}{20b^3d^4}+\frac{B^2g^3i^2(a+bx)^4(bc-ad)^2}{60b^3}+\frac{3B^2g^3i^2x(bc-ad)^5}{20b^2d^3}-\frac{3B^2g^3i^2(c+dx)^2(bc-ad)^4}{40bd^4}+\frac{B^2g^3i^2(c+dx)^3(bc-ad)^3}{60d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,
x]
```

```
[Out] (3*B^2*(b*c - a*d)^5*g^3*i^2*x)/(20*b^2*d^3) + (B^2*(b*c - a*d)^2*g^3*i^2*(
a + b*x)^4)/(60*b^3) - (3*B^2*(b*c - a*d)^4*g^3*i^2*(c + d*x)^2)/(40*b*d^4)
 + (B^2*(b*c - a*d)^3*g^3*i^2*(c + d*x)^3)/(60*d^4) - (B*(b*c - a*d)^3*g^3*
i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(90*b^3*d) - (B*(b*c
- a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(20*b^3)
 - (B*(b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(15*b^2) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(60*b^3) + ((b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)
*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(15*b^2) + (g^3*i^2*(a + b*x)^4*(c
 + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(6*b) + (B*(b*c - a*d)^4*
```

```
g^3*i^2*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*
d^2) - (B*(b*c - a*d)^5*g^3*i^2*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x)
)/(c + d*x)]))/(180*b^3*d^3) - (B*(b*c - a*d)^6*g^3*i^2*Log[(b*c - a*d)/(b*
(c + d*x))]*(6*A + 11*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*d^4)
- (B^2*(b*c - a*d)^6*g^3*i^2*Log[c + d*x])/(20*b^3*d^4) - (B^2*(b*c - a*d)^
6*g^3*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(30*b^3*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*(S
implify[m + n + 2]/((b*c - a*d)*(m + 1))), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (64c+64dx)^2(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx = \int\left(\frac{4096(bc-ad)^2(ag+bgx)^3\left(A+B\log\left(\right.\right.}{b^2}\right.$$

$$= \frac{\left(4096(bc-ad)^2\right)\int (ag+bgx)^3\left(A+B\log\left(\frac{e}{}\right.\right.}{b^2}$$

$$= \frac{1024(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b^3}$$

$$= \frac{1024(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b^3}$$

$$= \frac{1024(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b^3}$$

$$= \frac{1024(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b^3}$$

$$= -\frac{2048AB(bc-ad)^5g^3x}{15b^2d^3} + \frac{1024B(bc-ad)^4g}{}$$

$$= -\frac{2048AB(bc-ad)^5g^3x}{15b^2d^3} - \frac{2048B^2(bc-ad)^5}{}$$

$$= -\frac{2048AB(bc-ad)^5g^3x}{15b^2d^3} - \frac{2048B^2(bc-ad)^5}{}$$

$$= -\frac{2048AB(bc-ad)^5g^3x}{15b^2d^3} + \frac{4096B^2(bc-ad)^5}{45b^2d^3}$$

$$= -\frac{2048AB(bc-ad)^5g^3x}{15b^2d^3} + \frac{4096B^2(bc-ad)^5}{45b^2d^3}$$

$$= -\frac{2048AB(bc-ad)^5g^3x}{15b^2d^3} + \frac{4096B^2(bc-ad)^5}{45b^2d^3}$$

$$= -\frac{2048AB(bc-ad)^5g^3x}{15b^2d^3} + \frac{4096B^2(bc-ad)^5}{45b^2d^3}$$

Mathematica [**B**] Leaf count is larger than twice the leaf count of optimal. 1559 vs. $2(711) = 1422$.

time = 0.91, size = 1559, normalized size = 2.19

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2,x]
```

```
[Out] (g^3*i^2*(15*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2 + 24*d*(b*c - a*d)*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
10*d^2*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (5*B*(b*c - a*d
)^3*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*
x))/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/
(c + d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*
(b*c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)])*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2
- 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)
*Log[c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4
 + (2*B*(b*c - a*d)^2*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a +
 b*x)*Log[(e*(a + b*x))/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c +
 d*x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[(e*
(a + b*x))/(c + d*x)])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*
x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*
(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*
(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Lo
g[c + d*x]) + 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4 -
 (B*(b*c - a*d)*(24*b^2*B*c*d*(b*c - a*d)^3*x + 120*A*b*d*(b*c - a*d)^4*x +
 130*b*B*d*(b*c - a*d)^4*x + 24*a*b*B*d^2*(-(b*c) + a*d)^3*x - 12*b*B*c*d^2
*(b*c - a*d)^2*(a + b*x)^2 + 12*a*B*d^3*(b*c - a*d)^2*(a + b*x)^2 + 35*B*d^
2*(-(b*c) + a*d)^3*(a + b*x)^2 + 8*b*B*c*d^3*(b*c - a*d)*(a + b*x)^3 + 10*B
*d^3*(b*c - a*d)^2*(a + b*x)^3 + 8*a*B*d^4*(-(b*c) + a*d)*(a + b*x)^3 - 6*b
*B*c*d^4*(a + b*x)^4 + 6*a*B*d^5*(a + b*x)^4 + 120*B*d*(b*c - a*d)^4*(a + b
*x)*Log[(e*(a + b*x))/(c + d*x)] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*
Log[(e*(a + b*x))/(c + d*x)]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]) + 24*d^5*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(
c + d*x)]) - 24*b*B*c*(b*c - a*d)^4*Log[c + d*x] + 24*a*B*d*(b*c - a*d)^4*L
og[c + d*x] - 250*B*(b*c - a*d)^5*Log[c + d*x] - 120*(b*c - a*d)^5*(A + B*L
og[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 60*B*(b*c - a*d)^5*((2*Log[(d*(
a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])))/(6*d^4)))/(60*b^3)
```

Maple [F]
time = 0.55, size = 0, normalized size = 0.00

$$\int (bgx+ag)^3 (dix+ci)^2 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 4015 vs. 2(644) = 1288.
time = 0.44, size = 4015, normalized size = 5.65

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="maxima")
```

```
[Out] -1/6*A^2*b^3*d^2*g^3*x^6 - 2/5*A^2*b^3*c*d*g^3*x^5 - 3/5*A^2*a*b^2*d^2*g^3*
x^5 - 1/4*A^2*b^3*c^2*g^3*x^4 - 3/2*A^2*a*b^2*c*d*g^3*x^4 - 3/4*A^2*a^2*b*d
^2*g^3*x^4 - A^2*a*b^2*c^2*g^3*x^3 - 2*A^2*a^2*b*c*d*g^3*x^3 - 1/3*A^2*a^3*
d^2*g^3*x^3 - 3/2*A^2*a^2*b*c^2*g^3*x^2 - A^2*a^3*c*d*g^3*x^2 - 2*(x*log(b*
x*e/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a
^3*c^2*g^3 - 3*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)
/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*b*c^2*g^3 - (2*x
^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*lo
g(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d
^2))*A*B*a*b^2*c^2*g^3 - 1/12*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) -
 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^
3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)
)*A*B*b^3*c^2*g^3 - 2*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b
*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^3*c*d*g^3 -
 2*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2
*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)
/(b^2*d^2))*A*B*a^2*b*c*d*g^3 - 1/2*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x +
 c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*
b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^
3*d^3))*A*B*a*b^2*c*d*g^3 - 1/15*(12*x^5*log(b*x*e/(d*x + c) + a*e/(d*x + c
)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*
b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4
)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^3*c*d*g^3 - 1/3*(2*x^3*l
og(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*
```

```
x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))
*A*B*a^3*d^2*g^3 - 1/4*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*
log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3
- 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a
^2*b*d^2*g^3 - 1/10*(12*x^5*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 12*a^5*l
og(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4
- 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b
^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*a*b^2*d^2*g^3 - 1/180*(60*x^6*log(b*x*e
/(d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6*log(d*x + c)
/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4
 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60
*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*A*B*b^3*d^2*g^3 - A^2*a^3*c^2*g^3*x - 1/
180*(8*b^5*c^6*g^3 - 42*a*b^4*c^5*d*g^3 + 87*a^2*b^3*c^4*d^2*g^3 - 86*a^3*b
^2*c^3*d^3*g^3 - 33*a^4*b*c^2*d^4*g^3 + 6*a^5*c*d^5*g^3)*B^2*log(d*x + c)/(
b^2*d^4) - 1/30*(b^6*c^6*g^3 - 6*a*b^5*c^5*d*g^3 + 15*a^2*b^4*c^4*d^2*g^3 -
 20*a^3*b^3*c^3*d^3*g^3 + 15*a^4*b^2*c^2*d^4*g^3 - 6*a^5*b*c*d^5*g^3 + a^6*
d^6*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
 a*d)/(b*c - a*d)))*B^2/(b^3*d^4) - 1/360*(60*B^2*b^6*d^6*g^3*x^6 + 120*(b^
6*c*d^5*g^3 + 2*a*b^5*d^6*g^3)*B^2*x^5 + 6*(9*b^6*c^2*d^4*g^3 + 82*a*b^5*c*
d^5*g^3 + 59*a^2*b^4*d^6*g^3)*B^2*x^4 + 2*(b^6*c^3*d^3*g^3 + 105*a*b^5*c^2*
d^4*g^3 + 387*a^2*b^4*c*d^5*g^3 + 107*a^3*b^3*d^6*g^3)*B^2*x^3 - (b^6*c^4*d
^2*g^3 - 10*a*b^5*c^3*d^3*g^3 - 300*a^2*b^4*c^2*d^4*g^3 - 574*a^3*b^3*c*d^5
*g^3 - 17*a^4*b^2*d^6*g^3)*B^2*x^2 - 2*(2*b^6*c^5*d*g^3 - 9*a*b^5*c^4*d^2*g
^3 + 13*a^2*b^4*c^3*d^3*g^3 - 113*a^3*b^3*c^2*d^4*g^3 - 87*a^4*b^2*c*d^5*g^
3 + 14*a^5*b*d^6*g^3)*B^2*x + 6*(10*B^2*b^6*d^6*g^3*x^6 + 60*B^2*a^3*b^3*c^
2*d^4*g^3*x + 12*(2*b^6*c*d^5*g^3 + 3*a*b^5*d^6*g^3)*B^2*x^5 + 15*(b^6*c^2*
d^4*g^3 + 6*a*b^5*c*d^5*g^3 + 3*a^2*b^4*d^6*g^3)*B^2*x^4 + 20*(3*a*b^5*c^2*
d^4*g^3 + 6*a^2*b^4*c*d^5*g^3 + a^3*b^3*d^6*g^3)*B^2*x^3 + 30*(3*a^2*b^4*c^
2*d^4*g^3 + 2*a^3*b^3*c*d^5*g^3)*B^2*x^2 + (15*a^4*b^2*c^2*d^4*g^3 - 6*a^5*
b*c*d^5*g^3 + a^6*d^6*g^3)*B^2)*log(b*x + a)^2 + 6*(10*B^2*b^6*d^6*g^3*x^6
+ 60*B^2*a^3*b^3*c^2*d^4*g^3*x + 12*(2*b^6*c*d^5*g^3 + 3*a*b^5*d^6*g^3)*B^2
*x^5 + 15*(b^6*c^2*d^4*g^3 + 6*a*b^5*c*d^5*g^3 + 3*a^2*b^4*d^6*g^3)*B^2*x^4
 + 20*(3*a*b^5*c^2*d^4*g^3 + 6*a^2*b^4*c*d^5*g^3 + a^3*b^3*d^6*g^3)*B^2*x^3
 + 30*(3*a^2*b^4*c^2*d^4*g^3 + 2*a^3*b^3*c*d^5*g^3)*B^2*x^2 - (b^6*c^6*g^3
- 6*a*b^5*c^5*d*g^3 + 15*a^2*b^4*c^4*d^2*g^3 - 20*a^3*b^3*c^3*d^3*g^3)*B^2)
*log(d*x + c)^2 + 2*(60*B^2*b^6*d^6*g^3*x^6 + 12*(11*b^6*c*d^5*g^3 + 19*a*b
^5*d^6*g^3)*B^2*x^5 + 3*(23*b^6*c^2*d^4*g^3 + 174*a*b^5*c*d^5*g^3 + 103*a^2
*b^4*d^6*g^3)*B^2*x^4 - 2*(b^6*c^3*d^3*g^3 - 141*a*b^5*c^2*d^4*g^3 - 381*a^
2*b^4*c*d^5*g^3 - 79*a^3*b^3*d^6*g^3)*B^2*x^3 + 3*(b^6*c^4*d^2*g^3 - 6*a*b^
5*c^3*d^3*g^3 + 150*a^2*b^4*c^2*d^4*g^3 + 154*a^3*b^3*c*d^5*g^3 + a^4*b^2*d
^6*g^3)*B^2*x^2 - 6*(b^6*c^5*d*g^3 - 6*a*b^5*c^4*d^2*g^3 + 15*a^2*b^4*c^3*d
^3*g^3 - 65*a^3*b^3*c^2*d^4*g^3 - 6*a^4*b^2*c*d^5*g^3 + a^5*b*d^6*g^3)*B^2*
x - (6*a*b^5*c^5*d*g^3 - 33*a^2*b^4*c^4*d^2*g^3...
```

Fricas [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="fricas")
```

```
[Out] -1/60*(10*B^2*b^3*d^2*g^3*x^6 + 60*B^2*a^3*c^2*g^3*x + 12*(2*B^2*b^3*c*d +
3*B^2*a*b^2*d^2)*g^3*x^5 + 15*(B^2*b^3*c^2 + 6*B^2*a*b^2*c*d + 3*B^2*a^2*b*
d^2)*g^3*x^4 + 20*(3*B^2*a*b^2*c^2 + 6*B^2*a^2*b*c*d + B^2*a^3*d^2)*g^3*x^3
 + 30*(3*B^2*a^2*b*c^2 + 2*B^2*a^3*c*d)*g^3*x^2)*log((b*x + a)*e/(d*x + c))
^2 + integral(-1/30*(30*A^2*b^4*d^3*g^3*x^7 + 30*A^2*a^4*c^3*g^3 + 30*(3*A^
2*b^4*c*d^2 + 4*A^2*a*b^3*d^3)*g^3*x^6 + 90*(A^2*b^4*c^2*d + 4*A^2*a*b^3*c*
d^2 + 2*A^2*a^2*b^2*d^3)*g^3*x^5 + 30*(A^2*b^4*c^3 + 12*A^2*a*b^3*c^2*d + 1
8*A^2*a^2*b^2*c*d^2 + 4*A^2*a^3*b*d^3)*g^3*x^4 + 30*(4*A^2*a*b^3*c^3 + 18*A
^2*a^2*b^2*c^2*d + 12*A^2*a^3*b*c*d^2 + A^2*a^4*d^3)*g^3*x^3 + 90*(2*A^2*a^
2*b^2*c^3 + 4*A^2*a^3*b*c^2*d + A^2*a^4*c*d^2)*g^3*x^2 + 30*(4*A^2*a^3*b*c^
3 + 3*A^2*a^4*c^2*d)*g^3*x + (60*A*B*b^4*d^3*g^3*x^7 + 60*A*B*a^4*c^3*g^3 +
 10*((18*A*B - B^2)*b^4*c*d^2 + (24*A*B + B^2)*a*b^3*d^3)*g^3*x^6 + 12*((15
*A*B - 2*B^2)*b^4*c^2*d + (60*A*B - B^2)*a*b^3*c*d^2 + 3*(10*A*B + B^2)*a^2
*b^2*d^3)*g^3*x^5 + 15*((4*A*B - B^2)*b^4*c^3 + (48*A*B - 5*B^2)*a*b^3*c^2*
d + 3*(24*A*B + B^2)*a^2*b^2*c*d^2 + (16*A*B + 3*B^2)*a^3*b*d^3)*g^3*x^4 +
20*(3*(4*A*B - B^2)*a*b^3*c^3 + 3*(18*A*B - B^2)*a^2*b^2*c^2*d + (36*A*B +
5*B^2)*a^3*b*c*d^2 + (3*A*B + B^2)*a^4*d^3)*g^3*x^3 + 30*(3*(4*A*B - B^2)*a
^2*b^2*c^3 + (24*A*B + B^2)*a^3*b*c^2*d + 2*(3*A*B + B^2)*a^4*c*d^2)*g^3*x^
2 + 60*((4*A*B - B^2)*a^3*b*c^3 + (3*A*B + B^2)*a^4*c^2*d)*g^3*x)*log((b*x
+ a)*e/(d*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(I*d*x + I*c)^2*(B*log((b*x + a)*e/(d*x + c)) + A
)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)^3\,(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2,
x)
```

```
[Out] int((a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2,
 x)
```

3.65 $\int (ag+bgx)^2(ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=761

$$-\frac{B^2(bc-ad)^4g^2i^2x}{10b^2d^2}-\frac{B^2(bc-ad)^3g^2i^2(c+dx)^2}{20bd^3}+\frac{B^2(bc-ad)^2g^2i^2(c+dx)^3}{30d^3}+\frac{B^2(bc-ad)^5g^2i^2\log\left(\frac{a+bx}{c+dx}\right)}{30b^3d^3}-$$

```
[Out] -1/10*B^2*(-a*d+b*c)^4*g^2*i^2*x/b^2/d^2-1/20*B^2*(-a*d+b*c)^3*g^2*i^2*(d*x
+c)^2/b/d^3+1/30*B^2*(-a*d+b*c)^2*g^2*i^2*(d*x+c)^3/d^3+1/30*B^2*(-a*d+b*c)
^5*g^2*i^2*ln((b*x+a)/(d*x+c))/b^3/d^3-1/30*B*(-a*d+b*c)^3*g^2*i^2*(b*x+a)^
2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^3/d-1/15*B*(-a*d+b*c)^2*g^2*i^2*(b*x+a)^3*(
A+B*ln(e*(b*x+a)/(d*x+c)))/b^3-1/5*B*(-a*d+b*c)^3*g^2*i^2*(d*x+c)^2*(A+B*ln
(e*(b*x+a)/(d*x+c)))/b/d^3+4/15*B*(-a*d+b*c)^2*g^2*i^2*(d*x+c)^3*(A+B*ln(e*
(b*x+a)/(d*x+c)))/d^3-1/10*b*B*(-a*d+b*c)*g^2*i^2*(d*x+c)^4*(A+B*ln(e*(b*x+
a)/(d*x+c)))/d^3+1/30*(-a*d+b*c)^2*g^2*i^2*(b*x+a)^3*(A+B*ln(e*(b*x+a)/(d*x
+c)))^2/b^3+1/10*(-a*d+b*c)*g^2*i^2*(b*x+a)^3*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*
x+c)))^2/b^2+1/5*g^2*i^2*(b*x+a)^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/
b+1/30*B*(-a*d+b*c)^4*g^2*i^2*(b*x+a)*(2*A+B+2*B*ln(e*(b*x+a)/(d*x+c)))/b^3
/d^2+1/30*B*(-a*d+b*c)^5*g^2*i^2*ln((-a*d+b*c)/b/(d*x+c))*(2*A+3*B+2*B*ln(e
*(b*x+a)/(d*x+c)))/b^3/d^3+1/10*B^2*(-a*d+b*c)^5*g^2*i^2*ln(d*x+c)/b^3/d^3+
1/15*B^2*(-a*d+b*c)^5*g^2*i^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^3/d^3
```

Rubi [A]
time = 0.63, antiderivative size = 761, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$, Rules used = {2562, 2383, 2381, 2384, 2354, 2438, 2373, 45, 2382, 12, 907}

$$\frac{B^2g^2i^2(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{15b^3d^3}+\frac{Bg^2i^2(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+3B\right)}{30b^3d^3}+\frac{Bg^2i^2(a+bx)(bc-ad)^4\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+B\right)}{30b^3d^2}-\frac{Bg^2i^2(a+bx)^2(bc-ad)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{30b^3d}+\frac{g^2i^2(a+bx)^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{30b^3}-\frac{Bg^2i^2(a+bx)^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{15b^3}+\frac{g^2i^2(a+bx)^3(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{10b^2}-\frac{Bg^2i^2(c+dx)^2(bc-ad)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5bd^3}+\frac{4Bg^2i^2(c+dx)^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{15d^3}-\frac{bBg^2i^2(c+dx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{10d^3}+\frac{g^2i^2(a+bx)^3(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{5b}+\frac{B^2g^2i^2(bc-ad)^5\log\left(\frac{a+bx}{c+dx}\right)}{30b^3d^3}+\frac{B^2g^2i^2(bc-ad)^5\log(c+dx)}{10b^3d^3}-\frac{B^2g^2i^2x(bc-ad)^4}{10b^2d^2}-\frac{B^2g^2i^2(c+dx)^2(bc-ad)^3}{20bd^3}+\frac{B^2g^2i^2(c+dx)^3(bc-ad)^2}{30d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,
x]
```

```
[Out] -1/10*(B^2*(b*c - a*d)^4*g^2*i^2*x)/(b^2*d^2) - (B^2*(b*c - a*d)^3*g^2*i^2*
(c + d*x)^2)/(20*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^2*(c + d*x)^3)/(30*d^3)
+ (B^2*(b*c - a*d)^5*g^2*i^2*Log[(a + b*x)/(c + d*x)])/(30*b^3*d^3) - (B*(b
*c - a*d)^3*g^2*i^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b
^3*d) - (B*(b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)]))/(15*b^3) - (B*(b*c - a*d)^3*g^2*i^2*(c + d*x)^2*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(5*b*d^3) + (4*B*(b*c - a*d)^2*g^2*i^2*(c + d*x)^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(15*d^3) - (b*B*(b*c - a*d)*g^2*i^2*(c + d
*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*d^3) + ((b*c - a*d)^2*g^2*i
^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(30*b^3) + ((b*c - a
```

```
*d)*g^2*i^2*(a + b*x)^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(
10*b^2) + (g^2*i^2*(a + b*x)^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*
x)])^2)/(5*b) + (B*(b*c - a*d)^4*g^2*i^2*(a + b*x)*(2*A + B + 2*B*Log[(e*(a
 + b*x))/(c + d*x)]))/(30*b^3*d^2) + (B*(b*c - a*d)^5*g^2*i^2*Log[(b*c - a*
d)/(b*(c + d*x))]*(2*A + 3*B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^3*d
^3) + (B^2*(b*c - a*d)^5*g^2*i^2*Log[c + d*x])/(10*b^3*d^3) + (B^2*(b*c - a
*d)^5*g^2*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(15*b^3*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
```

```
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (65c+65dx)^2(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int \Bigg(\frac{(-bc+ad)^2g^2(65c+65dx)^2 \big(A+B\,\mathrm{lo}}{d^2}$$

$$= \frac{(b^2g^2)\int(65c+65dx)^4 \Big(A+B\log\Big(\frac{e(a+bx)}{c+dx}\Big)}{4225d^2}$$

$$= \frac{4225(bc-ad)^2g^2(c+dx)^3 \Big(A+B\log\Big(\frac{e(a+}{c+}}{3d^3}$$

$$= \frac{4225(bc-ad)^2g^2(c+dx)^3 \Big(A+B\log\Big(\frac{e(a+}{c+}}{3d^3}$$

$$= \frac{4225(bc-ad)^2g^2(c+dx)^3 \Big(A+B\log\Big(\frac{e(a+}{c+}}{3d^3}$$

$$= \frac{4225(bc-ad)^2g^2(c+dx)^3 \Big(A+B\log\Big(\frac{e(a+}{c+}}{3d^3}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B(bc-ad)^3g^2}{}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g}{}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g}{}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g}{3b^2d^2}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g}{3b^2d^2}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g}{3b^2d^2}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g}{3b^2d^2}$$

Mathematica [A]
time = 0.62, size = 1194, normalized size = 1.57

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2,x]
```

```
[Out] (g^2*i^2*(20*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)])^2 + 30*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2 + 12*d^5*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 20*B*(b*c
 - a*d)^3*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a +
b*x))/(c + d*x)] - d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2
*B*(b*c - a*d)^2*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c
 + d*x)])*Log[c + d*x] + B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]
) + B*(b*c - a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*L
og[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) - 10*B*(b*c - a*d)^
2*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x)
)/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b
*c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)])*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 -
2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*L
og[c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B*(b
*c - a*d)*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e
*(a + b*x))/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24
*B*(b*c - a*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x - d^2*(a +
 b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*(b*c - a*d)^
2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^
3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Log[c + d*x])
+ 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*
Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(60*b^3*d^3)
```

Maple [F]
time = 0.45, size = 0, normalized size = 0.00

$$\int (bgx + ag)^2 (dix + ci)^2 \left(A + B\ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 2874 vs. 2(690) = 1380.

time = 0.41, size = 2874, normalized size = 3.78

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="maxima")
```

```
[Out] -1/5*A^2*b^2*d^2*g^2*x^5 - 1/2*A^2*b^2*c*d*g^2*x^4 - 1/2*A^2*a*b*d^2*g^2*x^
4 - 1/3*A^2*b^2*c^2*g^2*x^3 - 4/3*A^2*a*b*c*d*g^2*x^3 - 1/3*A^2*a^2*d^2*g^2
*x^3 - A^2*a*b*c^2*g^2*x^2 - A^2*a^2*c*d*g^2*x^2 - 2*(x*log(b*x*e/(d*x + c)
 + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a^2*c^2*g^2 -
2*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*lo
g(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a*b*c^2*g^2 - 1/3*(2*x^3*log(b*x*
e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/
d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^
2*c^2*g^2 - 2*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/
b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*c*d*g^2 - 4/3*(2*
x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*l
og(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*
d^2))*A*B*a*b*c*d*g^2 - 1/6*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6
*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)
*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*
A*B*b^2*c*d*g^2 - 1/3*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*l
og(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^
2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*d^2*g^2 - 1/6*(6*x^4*log(b*x*e/(d*x
+ c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (
2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3
- a^3*d^3)*x)/(b^3*d^3))*A*B*a*b*d^2*g^2 - 1/30*(12*x^5*log(b*x*e/(d*x + c)
 + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*
(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^
3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^2*d^2*g^2
 - A^2*a^2*c^2*g^2*x + 1/30*(2*b^4*c^5*g^2 - 8*a*b^3*c^4*d*g^2 + 11*a^2*b^2
*c^3*d^2*g^2 + 9*a^3*b*c^2*d^3*g^2 - 2*a^4*c*d^4*g^2)*B^2*log(d*x + c)/(b^2
*d^3) + 1/15*(b^5*c^5*g^2 - 5*a*b^4*c^4*d*g^2 + 10*a^2*b^3*c^3*d^2*g^2 - 10
*a^3*b^2*c^2*d^3*g^2 + 5*a^4*b*c*d^4*g^2 - a^5*d^5*g^2)*(log(b*x + a)*log((
b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3
*d^3) - 1/60*(12*B^2*b^5*d^5*g^2*x^5 + 12*(2*b^5*c*d^4*g^2 + 3*a*b^4*d^5*g^
2)*B^2*x^4 + 2*(5*b^5*c^2*d^3*g^2 + 38*a*b^4*c*d^4*g^2 + 17*a^2*b^3*d^5*g^2
)*B^2*x^3 + (b^5*c^3*d^2*g^2 + 27*a*b^4*c^2*d^3*g^2 + 87*a^2*b^3*c*d^4*g^2
+ 5*a^3*b^2*d^5*g^2)*B^2*x^2 + 2*(a*b^4*c^3*d^2*g^2 + 12*a^2*b^3*c^2*d^3*g^
2 + 21*a^3*b^2*c*d^4*g^2 - 4*a^4*b*d^5*g^2)*B^2*x + 2*(6*B^2*b^5*d^5*g^2*x^
5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*x + 15*(b^5*c*d^4*g^2 + a*b^4*d^5*g^2)*B^2*x
^4 + 10*(b^5*c^2*d^3*g^2 + 4*a*b^4*c*d^4*g^2 + a^2*b^3*d^5*g^2)*B^2*x^3 + 3
0*(a*b^4*c^2*d^3*g^2 + a^2*b^3*c*d^4*g^2)*B^2*x^2 + (10*a^3*b^2*c^2*d^3*g^2
```

```
 - 5*a^4*b*c*d^4*g^2 + a^5*d^5*g^2)*B^2)*log(b*x + a)^2 + 2*(6*B^2*b^5*d^5*
g^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*x + 15*(b^5*c*d^4*g^2 + a*b^4*d^5*g^2)
*B^2*x^4 + 10*(b^5*c^2*d^3*g^2 + 4*a*b^4*c*d^4*g^2 + a^2*b^3*d^5*g^2)*B^2*x
^3 + 30*(a*b^4*c^2*d^3*g^2 + a^2*b^3*c*d^4*g^2)*B^2*x^2 + (b^5*c^5*g^2 - 5*
a*b^4*c^4*d*g^2 + 10*a^2*b^3*c^3*d^2*g^2)*B^2)*log(d*x + c)^2 + 2*(12*B^2*b
^5*d^5*g^2*x^5 + 3*(9*b^5*c*d^4*g^2 + 11*a*b^4*d^5*g^2)*B^2*x^4 + 2*(7*b^5*
c^2*d^3*g^2 + 40*a*b^4*c*d^4*g^2 + 13*a^2*b^3*d^5*g^2)*B^2*x^3 - (b^5*c^3*d
^2*g^2 - 45*a*b^4*c^2*d^3*g^2 - 75*a^2*b^3*c*d^4*g^2 - a^3*b^2*d^5*g^2)*B^2
*x^2 + 2*(b^5*c^4*d*g^2 - 5*a*b^4*c^3*d^2*g^2 + 30*a^2*b^3*c^2*d^3*g^2 + 5*
a^3*b^2*c*d^4*g^2 - a^4*b*d^5*g^2)*B^2*x + (2*a*b^4*c^4*d*g^2 - 9*a^2*b^3*c
^3*d^2*g^2 + 29*a^3*b^2*c^2*d^3*g^2 - 12*a^4*b*c*d^4*g^2 + 2*a^5*d^5*g^2)*B
^2)*log(b*x + a) - 2*(12*B^2*b^5*d^5*g^2*x^5 + 3*(9*b^5*c*d^4*g^2 + 11*a*b^
4*d^5*g^2)*B^2*x^4 + 2*(7*b^5*c^2*d^3*g^2 + 40*a*b^4*c*d^4*g^2 + 13*a^2*b^3
*d^5*g^2)*B^2*x^3 - (b^5*c^3*d^2*g^2 - 45*a*b^4*c^2*d^3*g^2 - 75*a^2*b^3*c*
d^4*g^2 - a^3*b^2*d^5*g^2)*B^2*x^2 + 2*(b^5*c^4*d*g^2 - 5*a*b^4*c^3*d^2*g^2
 + 30*a^2*b^3*c^2*d^3*g^2 + 5*a^3*b^2*c*d^4*g^2 - a^4*b*d^5*g^2)*B^2*x + 2*
(6*B^2*b^5*d^5*g^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*x + 15*(b^5*c*d^4*g^2 +
 a*b^4*d^5*g^2)*B^2*x^4 + 10*(b^5*c^2*d^3*g^2 + 4*a*b^4*c*d^4*g^2 + a^2*b^3
*d^5*g^2)*B^2*x^3 + 30*(a*b^4*c^2*d^3*g^2 + a^2*b^3*c*d^4*g^2)*B^2*x^2 + (1
0*a^3*b^2*c^2*d^3*g^2 - 5*a^4*b*c*d^4*g^2 + a^5*d^5*g^2)*B^2)*log(b*x + a))
*log(d*x + c))/(b^3*d^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="fricas")
```

```
[Out] -1/30*(6*B^2*b^2*d^2*g^2*x^5 + 30*B^2*a^2*c^2*g^2*x + 15*(B^2*b^2*c*d + B^2
*a*b*d^2)*g^2*x^4 + 10*(B^2*b^2*c^2 + 4*B^2*a*b*c*d + B^2*a^2*d^2)*g^2*x^3
+ 30*(B^2*a*b*c^2 + B^2*a^2*c*d)*g^2*x^2)*log((b*x + a)*e/(d*x + c))^2 + in
tegral(-1/15*(15*A^2*b^3*d^3*g^2*x^6 + 15*A^2*a^3*c^3*g^2 + 45*(A^2*b^3*c*d
^2 + A^2*a*b^2*d^3)*g^2*x^5 + 45*(A^2*b^3*c^2*d + 3*A^2*a*b^2*c*d^2 + A^2*a
^2*b*d^3)*g^2*x^4 + 15*(A^2*b^3*c^3 + 9*A^2*a*b^2*c^2*d + 9*A^2*a^2*b*c*d^2
 + A^2*a^3*d^3)*g^2*x^3 + 45*(A^2*a*b^2*c^3 + 3*A^2*a^2*b*c^2*d + A^2*a^3*c
*d^2)*g^2*x^2 + 45*(A^2*a^2*b*c^3 + A^2*a^3*c^2*d)*g^2*x + (30*A*B*b^3*d^3*
g^2*x^6 + 30*A*B*a^3*c^3*g^2 + 6*((15*A*B - B^2)*b^3*c*d^2 + (15*A*B + B^2)
*a*b^2*d^3)*g^2*x^5 + 15*(18*A*B*a*b^2*c*d^2 + (6*A*B - B^2)*b^3*c^2*d + (6
*A*B + B^2)*a^2*b*d^3)*g^2*x^4 + 10*((3*A*B - B^2)*b^3*c^3 + 3*(9*A*B - B^2
)*a*b^2*c^2*d + 3*(9*A*B + B^2)*a^2*b*c*d^2 + (3*A*B + B^2)*a^3*d^3)*g^2*x^
3 + 30*(9*A*B*a^2*b*c^2*d + (3*A*B - B^2)*a*b^2*c^3 + (3*A*B + B^2)*a^3*c*d
^2)*g^2*x^2 + 30*((3*A*B - B^2)*a^2*b*c^3 + (3*A*B + B^2)*a^3*c^2*d)*g^2*x)
*log((b*x + a)*e/(d*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(I*d*x + I*c)^2*(B*log((b*x + a)*e/(d*x + c)) + A
)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)^2\,(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2,
x)
```

```
[Out] int((a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2,
 x)
```

3.66 $\int (ag+bgx)(ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=589

$$\frac{B^2(bc-ad)^3gi^2x}{12b^2d}+\frac{B^2(bc-ad)^2gi^2(c+dx)^2}{12bd^2}-\frac{B^2(bc-ad)^4gi^2\log\left(\frac{a+bx}{c+dx}\right)}{12b^3d^2}-\frac{B(bc-ad)^3gi^2(a+bx)\left(A+B\right.}{6b^3d}$$

```
[Out] 1/12*B^2*(-a*d+b*c)^3*g*i^2*x/b^2/d+1/12*B^2*(-a*d+b*c)^2*g*i^2*(d*x+c)^2/b
/d^2-1/12*B^2*(-a*d+b*c)^4*g*i^2*ln((b*x+a)/(d*x+c))/b^3/d^2-1/6*B*(-a*d+b*
c)^3*g*i^2*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^3/d-1/6*B*(-a*d+b*c)^2*g*i
^2*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^3+1/4*B*(-a*d+b*c)^2*g*i^2*(d*x+
c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/d^2-1/6*B*(-a*d+b*c)*g*i^2*(d*x+c)^3*(A+
B*ln(e*(b*x+a)/(d*x+c)))/d^2+1/12*(-a*d+b*c)^2*g*i^2*(b*x+a)^2*(A+B*ln(e*(b
*x+a)/(d*x+c)))^2/b^3+1/6*(-a*d+b*c)*g*i^2*(b*x+a)^2*(d*x+c)*(A+B*ln(e*(b*x
+a)/(d*x+c)))^2/b^2+1/4*g*i^2*(b*x+a)^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)
))^2/b-1/6*B*(-a*d+b*c)^4*g*i^2*ln((-a*d+b*c)/b/(d*x+c))*(A+B+B*ln(e*(b*x+a
)/(d*x+c)))/b^3/d^2-1/4*B^2*(-a*d+b*c)^4*g*i^2*ln(d*x+c)/b^3/d^2-1/6*B^2*(-
a*d+b*c)^4*g*i^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^3/d^2
```

Rubi [A]
time = 0.42, antiderivative size = 589, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$, Rules used = {2562, 2383, 2381, 2384, 2354, 2438, 2373, 45, 2382, 12, 78}

$$-\frac{B^2gi^2(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{6b^3d^2}-\frac{Bgi^2(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A+B\right)}{6b^3d^2}-\frac{Bgi^2(a+bx)(bc-ad)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6b^3d}+\frac{gi^2(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{12b^3}-\frac{Bgi^2(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6b^3}+\frac{gi^2(a+bx)^2(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{6b^2}+\frac{Bgi^2(c+dx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4bd^2}-\frac{Bgi^2(c+dx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6d^2}+\frac{gi^2(a+bx)^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4b}-\frac{B^2gi^2(bc-ad)^4\log\left(\frac{a+bx}{c+dx}\right)}{12b^3d^2}-\frac{B^2gi^2(bc-ad)^4\log(c+dx)}{4b^3d^2}+\frac{B^2gi^2x(bc-ad)^3}{12b^2d}+\frac{B^2gi^2(c+dx)^2(bc-ad)^2}{12bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (B^2*(b*c - a*d)^3*g*i^2*x)/(12*b^2*d) + (B^2*(b*c - a*d)^2*g*i^2*(c + d*x)
^2)/(12*b*d^2) - (B^2*(b*c - a*d)^4*g*i^2*Log[(a + b*x)/(c + d*x)])/(12*b^3
*d^2) - (B*(b*c - a*d)^3*g*i^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(6*b^3*d) - (B*(b*c - a*d)^2*g*i^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(6*b^3) + (B*(b*c - a*d)^2*g*i^2*(c + d*x)^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(4*b*d^2) - (B*(b*c - a*d)*g*i^2*(c + d*x)^3*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(6*d^2) + ((b*c - a*d)^2*g*i^2*(a + b*x)^2*(A
 + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(12*b^3) + ((b*c - a*d)*g*i^2*(a + b*
x)^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(6*b^2) + (g*i^2*(a
+ b*x)^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b) - (B*(b*
c - a*d)^4*g*i^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(6*b^3*d^2) - (B^2*(b*c - a*d)^4*g*i^2*Log[c + d*x])/(4*b^3*
d^2) - (B^2*(b*c - a*d)^4*g*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(6
*b^3*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (66c+66dx)^2(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int \left(\frac{(-bc+ad)g(66c+66dx)^2\left(A+B\log\left(\right.\right.}{d}\right.$$

$$= \frac{(bg)\int(66c+66dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{66d}$$

$$= -\frac{1452(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+b}{c+dx}\right.\right.}{d^2}$$

$$= -\frac{1452(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+b}{c+dx}\right.\right.}{d^2}$$

$$= -\frac{1452(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+b}{c+dx}\right.\right.}{d^2}$$

$$= -\frac{1452(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+b}{c+dx}\right.\right.}{d^2}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B(bc-ad)^2g(c+}{}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{726B^2(bc-ad)^3g(a-}{b^3d}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{726B^2(bc-ad)^3g(a-}{b^3d}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-ad)^3gx}{b^2d} +$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-ad)^3gx}{b^2d} +$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-ad)^3gx}{b^2d} +$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-ad)^3gx}{b^2d} +$$

Mathematica [A]
time = 0.39, size = 677, normalized size = 1.15

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2,x]
```

```
[Out] (g*i^2*(-4*(b*c - a*d)*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
 3*b*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (4*B*(b*c - a*d)^
2*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*(b*d*x + (b*c - a*d)*Log[a + b*x])
 + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + b^2*(c + d*x)
^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*(b*c - a*d)^2*Log[a + b*x]*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c - a*d)^2*Log[c + d*x] - B*(b*c
- a*d)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) -
2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3 - (B*(b*c - a*d)*(6*A*b*d
*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[a + b*x]) - B
*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a
 + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 3*b
^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b^3*(c
+ d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^3*Log[a + b*x
]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[c + d*x] - 3
*B*(b*c - a*d)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a
*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3))/(12*d^2)
```

Maple [**F**]
time = 0.29, size = 0, normalized size = 0.00

$$\int (bgx + ag)\,(dix + ci)^2 \left(A + B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1736 vs. 2(531) = 1062.
time = 0.39, size = 1736, normalized size = 2.95

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="maxima")
```

```
[Out] -1/4*A^2*b*d^2*g*x^4 - 2/3*A^2*b*c*d*g*x^3 - 1/3*A^2*a*d^2*g*x^3 - 1/2*A^2*
b*c^2*g*x^2 - A^2*a*c*d*g*x^2 - 2*(x*log(b*x*e/(d*x + c) + a*e/(d*x + c)) +
 a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a*c^2*g - (x^2*log(b*x*e/(d*x + c
```

```
) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a
*d)*x/(b*d))*A*B*b*c^2*g - 2*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^
2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a*c*d*
g - 2/3*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^
3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^
2)*x)/(b^2*d^2))*A*B*b*c*d*g - 1/3*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x +
c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2
)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*d^2*g - 1/12*(6*x^4*log(b
*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x +
c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6
*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b*d^2*g - A^2*a*c^2*g*x - 1/12*(b^3*
c^4*g - 2*a*b^2*c^3*d*g - 7*a^2*b*c^2*d^2*g + 2*a^3*c*d^3*g)*B^2*log(d*x +
c)/(b^2*d^2) - 1/6*(b^4*c^4*g - 4*a*b^3*c^3*d*g + 6*a^2*b^2*c^2*d^2*g - 4*a
^3*b*c*d^3*g + a^4*d^4*g)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1)
+ dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^2) - 1/12*(3*B^2*b^4*d^4*g*
x^4 + 6*(b^4*c*d^3*g + a*b^3*d^4*g)*B^2*x^3 + 2*(b^4*c^2*d^2*g + 7*a*b^3*c*
d^3*g + a^2*b^2*d^4*g)*B^2*x^2 + (b^4*c^3*d*g + a*b^3*c^2*d^2*g + 13*a^2*b^
2*c*d^3*g - 3*a^3*b*d^4*g)*B^2*x + (3*B^2*b^4*d^4*g*x^4 + 12*B^2*a*b^3*c^2*
d^2*g*x + 4*(2*b^4*c*d^3*g + a*b^3*d^4*g)*B^2*x^3 + 6*(b^4*c^2*d^2*g + 2*a*
b^3*c*d^3*g)*B^2*x^2 + (6*a^2*b^2*c^2*d^2*g - 4*a^3*b*c*d^3*g + a^4*d^4*g)*
B^2)*log(b*x + a)^2 + (3*B^2*b^4*d^4*g*x^4 + 12*B^2*a*b^3*c^2*d^2*g*x + 4*(
2*b^4*c*d^3*g + a*b^3*d^4*g)*B^2*x^3 + 6*(b^4*c^2*d^2*g + 2*a*b^3*c*d^3*g)*
B^2*x^2 - (b^4*c^4*g - 4*a*b^3*c^3*d*g)*B^2)*log(d*x + c)^2 + (6*B^2*b^4*d^
4*g*x^4 + 2*(7*b^4*c*d^3*g + 5*a*b^3*d^4*g)*B^2*x^3 + (7*b^4*c^2*d^2*g + 28
*a*b^3*c*d^3*g + a^2*b^2*d^4*g)*B^2*x^2 - 2*(b^4*c^3*d*g - 10*a*b^3*c^2*d^2
*g - 4*a^2*b^2*c*d^3*g + a^3*b*d^4*g)*B^2*x - (2*a*b^3*c^3*d*g - 13*a^2*b^2
*c^2*d^2*g + 6*a^3*b*c*d^3*g - a^4*d^4*g)*B^2)*log(b*x + a) - (6*B^2*b^4*d^
4*g*x^4 + 2*(7*b^4*c*d^3*g + 5*a*b^3*d^4*g)*B^2*x^3 + (7*b^4*c^2*d^2*g + 28
*a*b^3*c*d^3*g + a^2*b^2*d^4*g)*B^2*x^2 - 2*(b^4*c^3*d*g - 10*a*b^3*c^2*d^2
*g - 4*a^2*b^2*c*d^3*g + a^3*b*d^4*g)*B^2*x + 2*(3*B^2*b^4*d^4*g*x^4 + 12*B
^2*a*b^3*c^2*d^2*g*x + 4*(2*b^4*c*d^3*g + a*b^3*d^4*g)*B^2*x^3 + 6*(b^4*c^2
*d^2*g + 2*a*b^3*c*d^3*g)*B^2*x^2 + (6*a^2*b^2*c^2*d^2*g - 4*a^3*b*c*d^3*g
+ a^4*d^4*g)*B^2)*log(b*x + a))*log(d*x + c))/(b^3*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="fricas")
```

```
[Out] -1/12*(3*B^2*b*d^2*g*x^4 + 12*B^2*a*c^2*g*x + 4*(2*B^2*b*c*d + B^2*a*d^2)*g
*x^3 + 6*(B^2*b*c^2 + 2*B^2*a*c*d)*g*x^2)*log((b*x + a)*e/(d*x + c))^2 + in
```

```
tegral(-1/6*(6*A^2*b^2*d^3*g*x^5 + 6*A^2*a^2*c^3*g + 6*(3*A^2*b^2*c*d^2 + 2
*A^2*a*b*d^3)*g*x^4 + 6*(3*A^2*b^2*c^2*d + 6*A^2*a*b*c*d^2 + A^2*a^2*d^3)*g
*x^3 + 6*(A^2*b^2*c^3 + 6*A^2*a*b*c^2*d + 3*A^2*a^2*c*d^2)*g*x^2 + 6*(2*A^2
*a*b*c^3 + 3*A^2*a^2*c^2*d)*g*x + (12*A*B*b^2*d^3*g*x^5 + 12*A*B*a^2*c^3*g
+ 3*((12*A*B - B^2)*b^2*c*d^2 + (8*A*B + B^2)*a*b*d^3)*g*x^4 + 4*((9*A*B -
2*B^2)*b^2*c^2*d + (18*A*B + B^2)*a*b*c*d^2 + (3*A*B + B^2)*a^2*d^3)*g*x^3
+ 6*((2*A*B - B^2)*b^2*c^3 + (12*A*B - B^2)*a*b*c^2*d + 2*(3*A*B + B^2)*a^2
*c*d^2)*g*x^2 + 12*((2*A*B - B^2)*a*b*c^3 + (3*A*B + B^2)*a^2*c^2*d)*g*x)*l
og((b*x + a)*e/(d*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(I*d*x + I*c)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^
2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)\,{\left(c\,i+d\,i\,x\right)}^2\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x
)
```

3.67 $\int (ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=334

$$\frac{B^2(bc-ad)^2i^2x}{3b^2}+\frac{B^2(bc-ad)^3i^2\log\left(\frac{a+bx}{c+dx}\right)}{3b^3d}-\frac{2B(bc-ad)^2i^2(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^3}-\frac{B(bc-ad)i^2}{}$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*i^2*x/b^2+1/3*B^2*(-a*d+b*c)^3*i^2*ln((b*x+a)/(d*x+c))
/b^3/d-2/3*B*(-a*d+b*c)^2*i^2*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^3-1/3*B
*(-a*d+b*c)*i^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/d+1/3*i^2*(d*x+c)^3
*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d+B^2*(-a*d+b*c)^3*i^2*ln(d*x+c)/b^3/d+2/3*B
*(-a*d+b*c)^3*i^2*(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(1-b*(d*x+c)/d/(b*x+a))/b^3
/d-2/3*B^2*(-a*d+b*c)^3*i^2*polylog(2,b*(d*x+c)/d/(b*x+a))/b^3/d
```

Rubi [A]
time = 0.25, antiderivative size = 334, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {2552, 2356, 2389, 2379, 2438, 2351, 31, 46}

$$-\frac{2B^2i^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{3b^3d}+\frac{2Bi^2(bc-ad)^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^3d}-\frac{2Bi^2(a+bx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^3}-\frac{Bi^2(c+dx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3bd}+\frac{i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3d}+\frac{B^2i^2(bc-ad)^3\log\left(\frac{a+bx}{c+dx}\right)}{3b^3d}+\frac{B^2i^2(bc-ad)^3\log(c+dx)}{b^3d}+\frac{B^2i^2x(bc-ad)^2}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (B^2*(b*c - a*d)^2*i^2*x)/(3*b^2) + (B^2*(b*c - a*d)^3*i^2*Log[(a + b*x)/(c
 + d*x)])/(3*b^3*d) - (2*B*(b*c - a*d)^2*i^2*(a + b*x)*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(3*b^3) - (B*(b*c - a*d)*i^2*(c + d*x)^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(3*b*d) + (i^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(
c + d*x)])^2)/(3*d) + (B^2*(b*c - a*d)^3*i^2*Log[c + d*x])/(b^3*d) + (2*B*(
b*c - a*d)^3*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))
/(d*(a + b*x))])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*i^2*PolyLog[2, (b*(c + d*
x))/(d*(a + b*x))])/(3*b^3*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2552

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(
m + 1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a
 + b*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && EqQ[n
 + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d, 0] && IntegersQ[m, p] && EqQ[d*f
- c*g, 0] && (GtQ[p, 0] || LtQ[m, -1])
```

Rubi steps

$$\int (67c+67dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{4489(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d} - (2B)\int \frac{300763(b$$

$$= \frac{4489(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d} - (8978B(bc-a$$

$$= \frac{4489(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d} - (8978B(bc-a$$

$$= \frac{4489(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d} - (8978B(bc-a$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} - \frac{4489B(bc-ad)(c+dx)^2(A-}{3bd}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} - \frac{8978B^2(bc-ad)^2(a+bx)\log}{3b^3}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} - \frac{8978B^2(bc-ad)^2(a+bx)\log}{3b^3}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + 4489B^2$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + 4489B^2$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + 4489B^2$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + 4489B^2$$

Mathematica [A]

time = 0.14, size = 287, normalized size = 0.86

$$\frac{i^2\left((c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - \frac{B(bc-ad)\left(2Abd(bc-ad)x-B(bc-ad)(bdx+(bc-ad)\log(a+bx))+2Bd(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+b^2(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+2(bc-ad)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-2B(bc-ad)^2\log(c+dx)-B(bc-ad)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{b^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (i^2*((c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*(
2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*(b*d*x + (b*c - a*d)*Log[a + b*x]) +
```

```
2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + b^2*(c + d*x)^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*(b*c - a*d)^2*Log[a + b*x]*(A + B*
Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c - a*d)^2*Log[c + d*x] - B*(b*c - a
*d)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3))/(3*d)
```

Maple [F]
time = 0.23, size = 0, normalized size = 0.00

$$\int (dix + ci)^2 \left(A + B\ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 914 vs. 2(300) = 600.
time = 0.36, size = 914, normalized size = 2.74

$$-\frac{1}{3}A^2d^2x^3 - A^2cdx^2 - 2\left(x\log\left(\frac{bxe}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)ABc^2 - 2\left(x^2\log\left(\frac{bxe}{dx+c} + \frac{ae}{dx+c}\right) - \frac{a^2\log(bx+a)}{b^2} + \frac{c^2\log(dx+c)}{d^2} - \frac{(bc-ad)x}{bd}\right)ABcd - \frac{1}{3}\left(2x^3\log\left(\frac{bxe}{dx+c} + \frac{ae}{dx+c}\right) + \frac{2a^3\log(bx+a)}{b^3} - \frac{2c^3\log(dx+c)}{d^3} - \frac{(b^2cd - abd^2)x^2 - 2(b^2c^2 - a^2d^2)x}{b^2d^2}\right)ABd^2 - A^2c^2x - \frac{(b^2c^3 - 5abc^2d + 2a^2cd^2)B^2\log(dx+c)}{3b^2d} + \frac{2(b^3c^3 - 3ab^2c^2d + 3a^2bcd^2 - a^3d^3)\left(\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad} + 1\right) + \mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B^2}{3b^3d} - \frac{B^2b^3d^3x^3 + (2b^3cd^2 + ab^2d^3)B^2x^2 + (4ab^2cd^2 - a^2bd^3)B^2x + (B^2b^3d^3x^3 + 3B^2b^3cd^2x^2 + 3B^2b^3c^2dx + (3ab^2c^2d - 3a^2bcd^2 + a^3d^3)B^2)\log(bx+a)^2 + (B^2b^3d^3x^3 + 3B^2b^3cd^2x^2 + 3B^2b^3c^2dx + B^2b^3c^3)\log(dx+c)^2 + (2B^2b^3d^3x^3 + (5b^3cd^2 + ab^2d^3)B^2x^2 + 2(b^3c^2d + 3ab^2cd^2 - a^2bd^3)B^2x + (2ab^2c^2d + a^2bcd^2 - a^3d^3)B^2)\log(bx+a) - (2B^2b^3d^3x^3 + (5b^3cd^2 + ab^2d^3)B^2x^2 + 2(b^3c^2d + 3ab^2cd^2 - a^2bd^3)B^2x + 2(B^2b^3d^3x^3 + 3B^2b^3cd^2x^2 + 3B^2b^3c^2dx + (3ab^2c^2d - 3a^2bcd^2 + a^3d^3)B^2)\log(bx+a))\log(dx+c)}{3b^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] -1/3*A^2*d^2*x^3 - A^2*c*d*x^2 - 2*(x*log(b*x*e/(d*x + c) + a*e/(d*x + c))
+ a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*c^2 - 2*(x^2*log(b*x*e/(d*x + c)
 + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*
d)*x/(b*d))*A*B*c*d - 1/3*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a
^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2
*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*d^2 - A^2*c^2*x - 1/3*(b^2*c^3 - 5*a
*b*c^2*d + 2*a^2*c*d^2)*B^2*log(d*x + c)/(b^2*d) + 2/3*(b^3*c^3 - 3*a*b^2*c
^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d)
 + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d) - 1/3*(B^2*b^3*d^3*x
^3 + (2*b^3*c*d^2 + a*b^2*d^3)*B^2*x^2 + (4*a*b^2*c*d^2 - a^2*b*d^3)*B^2*x
+ (B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*b^3*c^2*d*x + (3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 + a^3*d^3)*B^2)*log(b*x + a)^2 + (B^2*b^3*d^3*x^3 + 3*B^
2*b^3*c*d^2*x^2 + 3*B^2*b^3*c^2*d*x + B^2*b^3*c^3)*log(d*x + c)^2 + (2*B^2*
b^3*d^3*x^3 + (5*b^3*c*d^2 + a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^2*d + 3*a*b^2*c*
d^2 - a^2*b*d^3)*B^2*x + (2*a*b^2*c^2*d + a^2*b*c*d^2 - a^3*d^3)*B^2)*log(b
*x + a) - (2*B^2*b^3*d^3*x^3 + (5*b^3*c*d^2 + a*b^2*d^3)*B^2*x^2 + 2*(b^3*c
^2*d + 3*a*b^2*c*d^2 - a^2*b*d^3)*B^2*x + 2*(B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*
d^2*x^2 + 3*B^2*b^3*c^2*d*x + (3*a*b^2*c^2*d - 3*a^2*b*c*d^2 + a^3*d^3)*B^2
)*log(b*x + a))*log(d*x + c))/(b^3*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] -1/3*(B^2*d^2*x^3 + 3*B^2*c*d*x^2 + 3*B^2*c^2*x)*log((b*x + a)*e/(d*x + c))
^2 + integral(-1/3*(3*A^2*b*d^3*x^4 + 3*A^2*a*c^3 + 3*(3*A^2*b*c*d^2 + A^2*
a*d^3)*x^3 + 9*(A^2*b*c^2*d + A^2*a*c*d^2)*x^2 + 3*(A^2*b*c^3 + 3*A^2*a*c^2
*d)*x + 2*(3*A*B*b*d^3*x^4 + 3*A*B*a*c^3 + ((9*A*B - B^2)*b*c*d^2 + (3*A*B
+ B^2)*a*d^3)*x^3 + 3*((3*A*B - B^2)*b*c^2*d + (3*A*B + B^2)*a*c*d^2)*x^2 +
 3*((A*B - B^2)*b*c^3 + (3*A*B + B^2)*a*c^2*d)*x)*log((b*x + a)*e/(d*x + c)
))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

3.68 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=535

$$-\frac{Bd(bc-ad)i^2(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g}+\frac{2B(bc-ad)^2i^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g}+\frac{d(bc-}{}$$

```
[Out] -B*d*(-a*d+b*c)*i^2*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^3/g+2*B*(-a*d+b*c
)^2*i^2*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^3/g+d*(-a*d+
b*c)*i^2*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^3/g+1/2*i^2*(d*x+c)^2*(A+B
*ln(e*(b*x+a)/(d*x+c)))^2/b/g+B^2*(-a*d+b*c)^2*i^2*ln(d*x+c)/b^3/g+B*(-a*d+
b*c)^2*i^2*(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(1-b*(d*x+c)/d/(b*x+a))/b^3/g-(-a*
d+b*c)^2*i^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^3/g+
2*B^2*(-a*d+b*c)^2*i^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^3/g-B^2*(-a*d+b*c)^
2*i^2*polylog(2,b*(d*x+c)/d/(b*x+a))/b^3/g+2*B*(-a*d+b*c)^2*i^2*(A+B*ln(e*(
b*x+a)/(d*x+c)))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^3/g+2*B^2*(-a*d+b*c)^2*i^
2*polylog(3,b*(d*x+c)/d/(b*x+a))/b^3/g
```

Rubi [A]

time = 0.49, antiderivative size = 535, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$, Rules used = {2562, 2389, 2379, 2421, 6724, 2355, 2354, 2438, 2356, 2351, 31}

$$\frac{2Bi^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g}+\frac{2B^2i^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^3g}-\frac{B^2i^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g}+\frac{2B^2i^2(bc-ad)^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g}+\frac{di^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^3g}-\frac{Bdi^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g}+\frac{2Bi^2(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g}-\frac{i^2(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^3g}+\frac{Bi^2(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g}+\frac{i^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2bg}+\frac{B^2i^2(bc-ad)^2\log(c+dx)}{b^3g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x),
x]
```

```
[Out] -((B*d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3
*g)) + (2*B*(b*c - a*d)^2*i^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(b^3*g) + (d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[(
e*(a + b*x))/(c + d*x)])^2)/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b
*x))/(c + d*x)])^2)/(2*b*g) + (B^2*(b*c - a*d)^2*i^2*Log[c + d*x])/(b^3*g)
+ (B*(b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c +
 d*x))/(d*(a + b*x))])/(b^3*g) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c
 - a*d)^2*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^3*g) - (B^2*(b*c
- a*d)^2*i^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B*(b*c -
 a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(
d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*PolyLog[3, (b*(c + d*x))/
(d*(a + b*x))])/(b^3*g)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(68c+68dx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{4624d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{68d(68c+6\ldots}{\ldots}\right.$$

$$= \frac{(4624(bc-ad)^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx}{b^2} + \frac{(68d)\int(68c+68\ldots}{\ldots}$$

$$= \frac{4624d(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{2312(c+dx)^2\left(\ldots\right.}{\ldots}$$

$$= \frac{4624d(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{2312(c+dx)^2\left(\ldots\right.}{\ldots}$$

$$= \frac{4624d(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{2312(c+dx)^2\left(\ldots\right.}{\ldots}$$

$$= \frac{4624d(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{2312(c+dx)^2\left(\ldots\right.}{\ldots}$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} + \frac{9248aBd(bc-ad)\log(a+bx)\left(A\ldots\right.}{b^3g}$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624B^2d(bc-ad)(a+bx)\log\left(\frac{e(a\ldots}{c\ldots}\right.}{b^3g}$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624B^2d(bc-ad)(a+bx)\log\left(\frac{e(a\ldots}{c\ldots}\right.}{b^3g}$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624B^2d(bc-ad)(a+bx)\log\left(\frac{e(a\ldots}{c\ldots}\right.}{b^3g}$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624B^2d(bc-ad)(a+bx)\log\left(\frac{e(a\ldots}{c\ldots}\right.}{b^3g}$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{b^3g} + \ldots$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{b^3g} + \ldots$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{b^3g} + \ldots$$

$$= -\frac{4624ABd(bc-ad)x}{\ldots} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{\ldots}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1987 vs. $2(535) = 1070$.
time = 2.18, size = 1987, normalized size = 3.71

Too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x),x]
```

```
[Out] (i^2*(12*A^2*b*d*(2*b*c - a*d)*x + 6*A^2*b^2*d^2*x^2 + 12*A^2*(b*c - a*d)^2
*Log[a + b*x] - 24*A*b*B*c*(a*d*Log[a/b + x]^2 - 2*a*d*Log[a/b + x]*(1 + Lo
g[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*(b*c + a*d*Log[a + b*x] - a*d*
Log[(d*(a + b*x))/(-(b*c) + a*d)]) + (-(b*d*x) + a*d*Log[a + b*x])*Log[(e*(
a + b*x))/(c + d*x)]) - 2*a*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 12*A
*b^2*B*c^2*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Log[a/b + x] - Log[c/d + x] -
Log[(e*(a + b*x))/(c + d*x)]) - 2*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) +
 a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 6*A*B*(-4*a*d^2*(a + b*x
)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^2 + 4*a*b*d*(c + d*x)*(-1 +
Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2*Log[a/b + x] - 2*a^2*Log[a
 + b*x]) - 2*d^2*(b*x*(-2*a + b*x) + 2*a^2*Log[a + b*x])*(Log[a/b + x] - Lo
g[c/d + x] - Log[(e*(a + b*x))/(c + d*x)]) + b^2*(d*x*(-2*c + d*x) - 2*d^2*
x^2*Log[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*(Log[c/d + x]*Log[(d*(a
+ b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 8*b*B^2
*c*(Log[(e*(a + b*x))/(c + d*x)]*(-(a*d*Log[(e*(a + b*x))/(c + d*x)]^2) + 6
*(b*c - a*d)*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*d*Log[(e*(a + b*x))/(c + d*
x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c + b*d*x)])) + 6*(b*c - a*d + a*d*Log[
(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*a*d*P
olyLog[3, (d*(a + b*x))/(b*(c + d*x))]) + B^2*(4*a^2*d^2*Log[a/b + x]^3 - 1
2*a*d^2*(2*b*x - 2*(a + b*x)*Log[a/b + x] + (a + b*x)*Log[a/b + x]^2) - 3*d
^2*(b*x*(6*a - b*x) + (-6*a^2 - 4*a*b*x + 2*b^2*x^2)*Log[a/b + x] + 2*(a^2
- b^2*x^2)*Log[a/b + x]^2) - 12*a*b*d*(2*d*x - 2*(c + d*x)*Log[c/d + x] + (
c + d*x)*Log[c/d + x]^2) - 3*b^2*(d*x*(6*c - d*x) + (-6*c^2 - 4*c*d*x + 2*d
^2*x^2)*Log[c/d + x] + 2*(c^2 - d^2*x^2)*Log[c/d + x]^2) + 6*d^2*(b*x*(-2*a
 + b*x) + 2*a^2*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b
*x))/(c + d*x)])^2 - 6*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c
+ d*x)])*(-4*a*d^2*(a + b*x)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^2
 + 4*a*b*d*(c + d*x)*(-1 + Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2
*Log[a/b + x] - 2*a^2*Log[a + b*x]) + b^2*(d*x*(-2*c + d*x) - 2*d^2*x^2*Log
[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*(Log[c/d + x]*Log[(d*(a + b*x))
/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 6*(2*a*b*c*d +
 3*b^2*c*d*x + 3*a*b*d^2*x - b^2*d^2*x^2 - 2*a*b*d^2*x*Log[c/d + x] + b^2*d
^2*x^2*Log[c/d + x] - a^2*d^2*Log[a + b*x] - b^2*c^2*Log[c + d*x] - 2*a*b*c
*d*Log[c + d*x] - Log[a/b + x]*(b*d*(2*a*c + b*x*(2*c - d*x)) - 2*d^2*(a^2
- b^2*x^2)*Log[c/d + x] + (-2*b^2*c^2 + 2*a^2*d^2)*Log[(b*(c + d*x))/(b*c -
```

```
 a*d)]) + 2*(b^2*c^2 - a^2*d^2)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] +
4*a*d*(a*d + 2*b*d*x - b*d*x*Log[c/d + x] - b*c*Log[c + d*x] + Log[a/b + x]
*(-(d*(a + b*x)) + d*(a + b*x)*Log[c/d + x] + (b*c - a*d)*Log[(b*(c + d*x))
/(b*c - a*d)]) + (b*c - a*d)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*
a^2*d^2*(Log[a/b + x]^2*(Log[c/d + x] - Log[(b*(c + d*x))/(b*c - a*d)]) - 2
*Log[a/b + x]*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*PolyLog[3, (d*(a
 + b*x))/(-(b*c) + a*d)])) + 12*a^2*d^2*(Log[c/d + x]^2*Log[(d*(a + b*x))/(
-(b*c) + a*d)] + 2*Log[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*P
olyLog[3, (b*(c + d*x))/(b*c - a*d)])) - 12*b^2*B^2*c^2*(Log[(-(b*c) + a*d)
/(d*(a + b*x))]*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*Log[(e*(a + b*x))/(c + d
*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 2*PolyLog[3, (b*(c + d*x))/(
d*(a + b*x))])))/(12*b^3*g)
```

Maple [F]
time = 0.27, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{bgx+ag}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="maxima")
```

```
[Out] -2*A^2*c*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - 1/2*A^2*d^2*(2*a^2*log(b*x
+ a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) - A^2*c^2*log(b*g*x + a*g)/(b*g) -
1/2*(B^2*b^2*d^2*x^2 + 2*(2*b^2*c*d - a*b*d^2)*B^2*x + 2*(b^2*c^2 - 2*a*b*c
*d + a^2*d^2)*B^2*log(b*x + a))*log(d*x + c)^2/(b^3*g) + integrate(-(2*A*B*
b^3*c^3 + B^2*b^3*c^3 + (2*A*B*b^3*d^3 + B^2*b^3*d^3)*x^3 + 3*(2*A*B*b^3*c*
d^2 + B^2*b^3*c*d^2)*x^2 + (B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*b
^3*c^2*d*x + B^2*b^3*c^3)*log(b*x + a)^2 + 3*(2*A*B*b^3*c^2*d + B^2*b^3*c^2
*d)*x + 2*(A*B*b^3*c^3 + B^2*b^3*c^3 + (A*B*b^3*d^3 + B^2*b^3*d^3)*x^3 + 3*
(A*B*b^3*c*d^2 + B^2*b^3*c*d^2)*x^2 + 3*(A*B*b^3*c^2*d + B^2*b^3*c^2*d)*x)*
log(b*x + a) - (2*A*B*b^3*c^3 + 2*B^2*b^3*c^3 + (2*A*B*b^3*d^3 + 3*B^2*b^3*
d^3)*x^3 + (6*A*B*b^3*c*d^2 + (10*b^3*c*d^2 - a*b^2*d^3)*B^2)*x^2 + 2*(3*A*
B*b^3*c^2*d + (3*b^3*c^2*d + 2*a*b^2*c*d^2 - a^2*b*d^3)*B^2)*x + 2*(B^2*b^3
```

```
*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + (4*b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*
B^2*x + (b^3*c^3 + a*b^2*c^2*d - 2*a^2*b*c*d^2 + a^3*d^3)*B^2)*log(b*x + a)
)*log(d*x + c))/(b^4*d*g*x^2 + a*b^3*c*g + (b^4*c*g + a*b^3*d*g)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="fricas")
```

```
[Out] integral(-(A^2*d^2*x^2 + 2*A^2*c*d*x + A^2*c^2 + (B^2*d^2*x^2 + 2*B^2*c*d*x
 + B^2*c^2)*log((b*x + a)*e/(d*x + c))^2 + 2*(A*B*d^2*x^2 + 2*A*B*c*d*x + A
*B*c^2)*log((b*x + a)*e/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x),
x)
```

```
[Out] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x),
 x)
```

3.69 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=442

$$-\frac{2B^2(bc-ad)i^2(c+dx)}{b^2g^2(a+bx)}-\frac{2B(bc-ad)i^2(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)}+\frac{2Bd(bc-ad)i^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A\right.}{b^3g^2}$$

```
[Out] -2*B^2*(-a*d+b*c)*i^2*(d*x+c)/b^2/g^2/(b*x+a)-2*B*(-a*d+b*c)*i^2*(d*x+c)*(A
+B*ln(e*(b*x+a)/(d*x+c)))/b^2/g^2/(b*x+a)+2*B*d*(-a*d+b*c)*i^2*ln((-a*d+b*c
)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^3/g^2+d^2*i^2*(b*x+a)*(A+B*ln(e*
(b*x+a)/(d*x+c)))^2/b^3/g^2-(-a*d+b*c)*i^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c
)))^2/b^2/g^2/(b*x+a)-2*d*(-a*d+b*c)*i^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2*ln(1
-b*(d*x+c)/d/(b*x+a))/b^3/g^2+2*B^2*d*(-a*d+b*c)*i^2*polylog(2,d*(b*x+a)/b/
(d*x+c))/b^3/g^2+4*B*d*(-a*d+b*c)*i^2*(A+B*ln(e*(b*x+a)/(d*x+c)))*polylog(2
,b*(d*x+c)/d/(b*x+a))/b^3/g^2+4*B^2*d*(-a*d+b*c)*i^2*polylog(3,b*(d*x+c)/d/
(b*x+a))/b^3/g^2
```

Rubi [A]

time = 0.37, antiderivative size = 442, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {2562, 2395, 2342, 2341, 2355, 2354, 2438, 2379, 2421, 6724}

$$\frac{4Bdi^2(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2}+\frac{2B^2di^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^3g^2}+\frac{4B^2di^2(bc-ad)\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^2}+\frac{d^2i^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^3g^2}+\frac{2Bdi^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2}-\frac{2di^2(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^3g^2}-\frac{i^2(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^2g^2(a+bx)}-\frac{2Bi^2(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^2(a+bx)}-\frac{2B^2i^2(c+dx)(bc-ad)}{b^2g^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)*i^2*(c + d*x))/(b^2*g^2*(a + b*x)) - (2*B*(b*c - a*d)*i
^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*g^2*(a + b*x)) + (2
*B*d*(b*c - a*d)*i^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(b^3*g^2) + (d^2*i^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c +
 d*x)])^2)/(b^3*g^2) - ((b*c - a*d)*i^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/
(c + d*x)])^2)/(b^2*g^2*(a + b*x)) - (2*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a
+ b*x))/(c + d*x)])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2) + (2*
B^2*d*(b*c - a*d)*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^3*g^2) +
(4*B*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(
c + d*x))/(d*(a + b*x))])/(b^3*g^2) + (4*B^2*d*(b*c - a*d)*i^2*PolyLog[3, (
b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
```

```
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(69c+69dx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{4761d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} + \frac{4761(bc-ad)^2\left(A+B \ldots\right.}{b^2g^2(a+\ldots}\right.$$

$$= \frac{(4761d^2)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{b^2g^2} + \frac{(9522d(bc-ad))\int \ldots}{b^2 \ldots}$$

$$= \frac{4761d^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} - \frac{4761(bc-ad)^2\left(A+B\log \ldots\right.}{b^3g^2(a+bx)\ldots}$$

$$= \frac{4761d^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} - \frac{4761(bc-ad)^2\left(A+B\log \ldots\right.}{b^3g^2(a+bx)\ldots}$$

$$= \frac{4761d^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} - \frac{4761(bc-ad)^2\left(A+B\log \ldots\right.}{b^3g^2(a+bx)\ldots}$$

$$= \frac{4761d^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} - \frac{4761(bc-ad)^2\left(A+B\log \ldots\right.}{b^3g^2(a+bx)\ldots}$$

$$= -\frac{9522B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^2(a+bx)} + \frac{9522aBd^2\log(a \ldots}{\ldots}$$

$$= -\frac{9522B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^2(a+bx)} + \frac{9522aBd^2\log(a \ldots}{\ldots}$$

$$= -\frac{9522B^2d(bc-ad)\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g^2} - \frac{9522B(bc- \ldots}{\ldots}$$

$$= -\frac{9522B^2(bc-ad)^2}{b^3g^2(a+bx)} - \frac{9522B^2d(bc-ad)\log(a+bx)}{b^3g^2} - \frac{9522 \ldots}{\ldots}$$

$$= -\frac{9522B^2(bc-ad)^2}{b^3g^2(a+bx)} - \frac{9522B^2d(bc-ad)\log(a+bx)}{b^3g^2} - \frac{9522 \ldots}{\ldots}$$

$$= -\frac{9522B^2(bc-ad)^2}{b^3g^2(a+bx)} - \frac{9522B^2d(bc-ad)\log(a+bx)}{b^3g^2} - \frac{4761 \ldots}{\ldots}$$

$$= -\frac{9522B^2(bc-ad)^2}{b^3g^2(a+bx)} - \frac{9522B^2d(bc-ad)\log(a+bx)}{b^3g^2} - \frac{4761 \ldots}{\ldots}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 2652 vs. $2(442) = 884$.
time = 4.10, size = 2652, normalized size = 6.00

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^2,x]
```

```
[Out] (i^2*(3*A^2*b*d^2*x - (3*A^2*(b*c - a*d)^2)/(a + b*x) + 6*A^2*d*(b*c - a*d)
*Log[a + b*x] - (6*A*b^2*B*c^2*(-(d*(a + b*x)*Log[c/d + x]) + d*(a + b*x)*L
og[(d*(a + b*x))/(-(b*c) + a*d)] + (b*c - a*d)*(1 + Log[(e*(a + b*x))/(c +
d*x)])))/((b*c - a*d)*(a + b*x)) + (3*b^2*B^2*c^2*(-2*b*c + 2*a*d - 2*d*(a
+ b*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)] - 2*d*(a +
 b*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - (b*c - a*d)*Log[(e*(a + b
*x))/(c + d*x)]^2 + 2*d*(a + b*x)*Log[c + d*x] - 2*d*(a + b*x)*Log[(e*(a +
b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + d*(a + b*x)*(Log[a + b*x]
*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[
(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(a + b*x)) + 6*A*b*B*c*d*(Lo
g[a/b + x]^2 - 2*Log[a/b + x]*Log[a + b*x] - 2*Log[c/d + x]*Log[(d*(a + b*x
))/(-(b*c) + a*d)] + 2*Log[a + b*x]*((a*d)/(b*c - a*d) + Log[c/d + x] + Log
[(e*(a + b*x))/(c + d*x)]) + 2*a*((a + b*x)^(-1) + Log[(e*(a + b*x))/(c + d
*x)]/(a + b*x) + (d*Log[c + d*x])/(-(b*c) + a*d)) - 2*PolyLog[2, (b*(c + d*
x))/(b*c - a*d)]) + 6*A*B*d^2*((a + b*x)*(-1 + Log[a/b + x]) - a*Log[a/b +
x]^2 - (a^2*(1 + Log[a/b + x]))/(a + b*x) - b*(c/d + x)*(-1 + Log[c/d + x])
 + (a^2*Log[c/d + x])/(a + b*x) + (b*x - a^2/(a + b*x) - 2*a*Log[a + b*x])*
(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)]) + (a^2*d*(Log
[a + b*x] - Log[c + d*x]))/(-(b*c) + a*d) + 2*a*(Log[c/d + x]*Log[(d*(a + b
*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B^2*d^2*(6
*b*x - 6*(a + b*x)*Log[a/b + x] + 3*(a + b*x)*Log[a/b + x]^2 - 2*a*Log[a/b
+ x]^3 - (3*a^2*(2 + 2*Log[a/b + x] + Log[a/b + x]^2))/(a + b*x) + (3*b*(2*
d*x - 2*(c + d*x)*Log[c/d + x] + (c + d*x)*Log[c/d + x]^2))/d + 3*(b*x - a^
2/(a + b*x) - 2*a*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a +
 b*x))/(c + d*x)])^2 - (6*(a*d + 2*b*d*x - b*d*x*Log[c/d + x] - b*c*Log[c +
 d*x] + Log[a/b + x]*(-(d*(a + b*x)) + d*(a + b*x)*Log[c/d + x] + (b*c - a*
d)*Log[(b*(c + d*x))/(b*c - a*d)]) + (b*c - a*d)*PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)]))/d + (3*a^2*(d*(a + b*x)*Log[a/b + x]^2 + 2*((-(b*c) + a*d)
*Log[c/d + x] + d*(a + b*x)*(Log[a + b*x] - Log[c + d*x])) - 2*Log[a/b + x]
*((b*c - a*d)*Log[c/d + x] + d*(a + b*x)*Log[(b*(c + d*x))/(b*c - a*d)]) -
2*d*(a + b*x)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/((-(b*c) + a*d)*(a
 + b*x)) + (3*a^2*(-(b*(c + d*x)*Log[c/d + x]^2) + 2*d*(a + b*x)*Log[c/d +
x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x
```

```
))/(b*c - a*d)]))/((b*c - a*d)*(a + b*x)) + 6*(-Log[a/b + x] + Log[c/d + x]
 + Log[(e*(a + b*x))/(c + d*x)])*((a + b*x)*(-1 + Log[a/b + x]) - a*Log[a/b
 + x]^2 - (a^2*(1 + Log[a/b + x]))/(a + b*x) - b*(c/d + x)*(-1 + Log[c/d +
x]) + (a^2*Log[c/d + x])/(a + b*x) + (a^2*d*(Log[a + b*x] - Log[c + d*x]))/
(-(b*c) + a*d) + 2*a*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])) + 6*a*(Log[a/b + x]^2*(Log[c/d + x] - L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*Log[a/b + x]*PolyLog[2, (d*(a + b*x))/(-
(b*c) + a*d)] + 2*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d)]) - 6*a*(Log[c/d
+ x]^2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[c/d + x]*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)] - 2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])) + (2*b*B^2
*c*d*(6*b*c - 6*a*d - (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a + b*x) + 6*a*d
*Log[a/b + x] + 3*b*c*Log[a/b + x]^2 - 3*a*d*Log[a/b + x]^2 - 6*b*c*Log[c/d
 + x] + 6*b*c*Log[a + b*x] - 6*a*d*Log[a + b*x] - 6*b*c*Log[a/b + x]*Log[a
+ b*x] + 6*a*d*Log[a/b + x]*Log[a + b*x] + 6*b*c*Log[c/d + x]*Log[a + b*x]
- 6*a*d*Log[c/d + x]*Log[a + b*x] - 6*b*c*Log[c/d + x]*Log[(d*(a + b*x))/(-
(b*c) + a*d)] + 6*a*d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] - (6*b
*(b*c - a*d)*x*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x) + 6*b*c*Log[a + b*x]
*Log[(e*(a + b*x))/(c + d*x)] - 6*a*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d
*x)] + 3*a*d*Log[(e*(a + b*x))/(c + d*x)]^2 + 3*b*d*x*Log[(e*(a + b*x))/(c
+ d*x)]^2 - (3*b^2*x*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^2)/(a + b*x) -
3*b*c*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x))/(c + d*x)]^2 - a*
d*Log[(e*(a + b*x))/(c + d*x)]^3 + 6*b*c*Log[(e*(a + b*x))/(c + d*x)]*Log[(
b*c - a*d)/(b*c + b*d*x)] - 6*a*d*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a
*d)/(b*c + b*d*x)] + 3*a*d*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(
b*c + b*d*x)] + 6*(b*c - a*d + a*d*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))] - 6*(b*c - a*d)*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)] + 6*b*c*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(
a + b*x))] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 6*b*c*PolyLog[
3, (b*(c + d*x))/(d*(a + b*x))]))/(b*c - a*d)))/(3*b^3*g^2)
```

Maple [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{(bgx+ag)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="maxima")
```

```
[Out] A^2*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2)
)*d^2 - 2*A^2*c*d*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) + 2*
A*B*c^2*(log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^
2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/
((b^2*c - a*b*d)*g^2)) + A^2*c^2/(b^2*g^2*x + a*b*g^2) - (B^2*b^2*d^2*x^2 +
 B^2*a*b*d^2*x - (b^2*c^2 - 2*a*b*c*d + a^2*d^2)*B^2 + 2*((b^2*c*d - a*b*d^
2)*B^2*x + (a*b*c*d - a^2*d^2)*B^2)*log(b*x + a))*log(d*x + c)^2/(b^4*g^2*x
 + a*b^3*g^2) + integrate(-(B^2*b^3*c^3 + (2*A*B*b^3*d^3 + B^2*b^3*d^3)*x^3
 + 3*(2*A*B*b^3*c*d^2 + B^2*b^3*c*d^2)*x^2 + (B^2*b^3*d^3*x^3 + 3*B^2*b^3*c
*d^2*x^2 + 3*B^2*b^3*c^2*d*x + B^2*b^3*c^3)*log(b*x + a)^2 + (4*A*B*b^3*c^2
*d + 3*B^2*b^3*c^2*d)*x + 2*(B^2*b^3*c^3 + (A*B*b^3*d^3 + B^2*b^3*d^3)*x^3
+ 3*(A*B*b^3*c*d^2 + B^2*b^3*c*d^2)*x^2 + (2*A*B*b^3*c^2*d + 3*B^2*b^3*c^2*
d)*x)*log(b*x + a) - 2*((A*B*b^3*d^3 + 2*B^2*b^3*d^3)*x^3 + (b^3*c^3 - a*b^
2*c^2*d + 2*a^2*b*c*d^2 - a^3*d^3)*B^2 + (3*A*B*b^3*c*d^2 + (3*b^3*c*d^2 +
2*a*b^2*d^3)*B^2)*x^2 + 2*(A*B*b^3*c^2*d + (b^3*c^2*d + a*b^2*c*d^2)*B^2)*x
 + (B^2*b^3*d^3*x^3 + (5*b^3*c*d^2 - 2*a*b^2*d^3)*B^2*x^2 + (3*b^3*c^2*d +
4*a*b^2*c*d^2 - 4*a^2*b*d^3)*B^2*x + (b^3*c^3 + 2*a^2*b*c*d^2 - 2*a^3*d^3)*
B^2)*log(b*x + a))*log(d*x + c))/(b^5*d*g^2*x^3 + a^2*b^3*c*g^2 + (b^5*c*g^
2 + 2*a*b^4*d*g^2)*x^2 + (2*a*b^4*c*g^2 + a^2*b^3*d*g^2)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="fricas")
```

```
[Out] integral(-(A^2*d^2*x^2 + 2*A^2*c*d*x + A^2*c^2 + (B^2*d^2*x^2 + 2*B^2*c*d*x
 + B^2*c^2)*log((b*x + a)*e/(d*x + c))^2 + 2*(A*B*d^2*x^2 + 2*A*B*c*d*x + A
*B*c^2)*log((b*x + a)*e/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2),
x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{(a\,g+b\,g\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
2,x)
```

```
[Out] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
2, x)
```

3.70 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=387

$$-\frac{2B^2di^2(c+dx)}{b^2g^3(a+bx)}-\frac{B^2i^2(c+dx)^2}{4bg^3(a+bx)^2}-\frac{2Bdi^2(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^3(a+bx)}-\frac{Bi^2(c+dx)^2\left(A+B\log\left(\frac{e(a+b}{c+dx}\right.\right.}{2bg^3(a+bx)^2}$$

```
[Out] -2*B^2*d*i^2*(d*x+c)/b^2/g^3/(b*x+a)-1/4*B^2*i^2*(d*x+c)^2/b/g^3/(b*x+a)^2-
2*B*d*i^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2/g^3/(b*x+a)-1/2*B*i^2*(d*
x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/g^3/(b*x+a)^2-d*i^2*(d*x+c)*(A+B*ln(e*
(b*x+a)/(d*x+c)))^2/b^2/g^3/(b*x+a)-1/2*i^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*
x+c)))^2/b/g^3/(b*x+a)^2-d^2*i^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2*ln(1-b*(d*x+
c)/d/(b*x+a))/b^3/g^3+2*B*d^2*i^2*(A+B*ln(e*(b*x+a)/(d*x+c)))*polylog(2,b*(
d*x+c)/d/(b*x+a))/b^3/g^3+2*B^2*d^2*i^2*polylog(3,b*(d*x+c)/d/(b*x+a))/b^3/
g^3
```

Rubi [A]

time = 0.37, antiderivative size = 387, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2562, 2380, 2342, 2341, 2379, 2421, 6724}

$$\frac{2Bd^2i^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^3}+\frac{2B^2d^2i^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^3}-\frac{d^2i^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^3g^3}-\frac{di^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^2g^3(a+bx)}-\frac{2Bdi^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^3(a+bx)}-\frac{i^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2bg^3(a+bx)^2}-\frac{Bi^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2bg^3(a+bx)^2}-\frac{2B^2di^2(c+dx)}{b^2g^3(a+bx)}-\frac{B^2i^2(c+dx)^2}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
3,x]
```

```
[Out] (-2*B^2*d*i^2*(c + d*x))/(b^2*g^3*(a + b*x)) - (B^2*i^2*(c + d*x)^2)/(4*b*g
^3*(a + b*x)^2) - (2*B*d*i^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(b^2*g^3*(a + b*x)) - (B*i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(2*b*g^3*(a + b*x)^2) - (d*i^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])^2)/(b^2*g^3*(a + b*x)) - (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)])^2)/(2*b*g^3*(a + b*x)^2) - (d^2*i^2*(A + B*Log[(e*(a + b*x))/(
c + d*x)])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3) + (2*B*d^2*i^2
*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x)
)])/(b^3*g^3) + (2*B^2*d^2*i^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^
3*g^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(70c+70dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx = \int \left(\frac{4900(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^3(a+bx)^3} + \frac{9800d(bc-\cdots}{\cdots}\right.$$

$$= \frac{(4900d^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{b^2g^3} + \frac{(9800d(bc-ad))\int \frac{\left(A+B\cdots\right.}{\cdots}}{b^2g^3}$$

$$= -\frac{2450(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{9800d(bc-ad)\cdots}{b^3\cdots}$$

$$= -\frac{2450(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{9800d(bc-ad)\cdots}{b^3\cdots}$$

$$= -\frac{2450(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{9800d(bc-ad)\cdots}{b^3\cdots}$$

$$= -\frac{2450(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{9800d(bc-ad)\cdots}{b^3\cdots}$$

$$= -\frac{2450B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2} - \frac{14700Bd(bc-\cdots}{\cdots}$$

$$= -\frac{2450B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2} - \frac{14700Bd(bc-\cdots}{\cdots}$$

$$= -\frac{4900B^2d^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g^3} - \frac{2450B(bc-ad)^2\left(\cdots\right.}{b^3g^3(\cdots}$$

$$= -\frac{1225B^2(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{12250B^2d(bc-ad)}{b^3g^3(a+bx)} - \frac{12250B^2d^2\log\cdots}{b^3g^3}$$

$$= -\frac{1225B^2(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{12250B^2d(bc-ad)}{b^3g^3(a+bx)} - \frac{12250B^2d^2\log\cdots}{b^3g^3}$$

$$= -\frac{1225B^2(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{12250B^2d(bc-ad)}{b^3g^3(a+bx)} - \frac{12250B^2d^2\log\cdots}{b^3g^3}$$

$$= -\frac{1225B^2(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{12250B^2d(bc-ad)}{b^3g^3(a+bx)} - \frac{12250B^2d^2\log\cdots}{b^3g^3}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 3582 vs. $2(387) = 774$.
time = 4.02, size = 3582, normalized size = 9.26

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^3,x]
```

```
[Out] (i^2*(-6*A^2*(b*c - a*d)^4 + 24*A^2*d*(-(b*c) + a*d)^3*(a + b*x) + 12*A^2*d
^2*(b*c - a*d)^2*(a + b*x)^2*Log[a + b*x] - 6*A*b^2*B*c^2*(b^2*c^2 - 4*a*b*
c*d + a^2*d^2 - 2*b^2*c*d*x - 2*a*b*d^2*x - 2*b^2*d^2*x^2 + 2*d^2*(a + b*x)
^2*Log[c/d + x] - 2*d^2*(a + b*x)^2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*b
^2*c^2*Log[(e*(a + b*x))/(c + d*x)] - 4*a*b*c*d*Log[(e*(a + b*x))/(c + d*x)
] + 2*a^2*d^2*Log[(e*(a + b*x))/(c + d*x)]) - 12*A*b*B*c*d*(3*a*b^2*c^2 - 4
*a^2*b*c*d + a^3*d^2 + 4*b^3*c^2*x - 6*a*b^2*c*d*x + 2*a^2*b*d^2*x - 2*d*(-
2*b*c + a*d)*(a + b*x)^2*Log[a + b*x] + 2*(b*c - a*d)^2*(a + 2*b*x)*Log[(e*
(a + b*x))/(c + d*x)] - 4*a^2*b*c*d*Log[c + d*x] + 2*a^3*d^2*Log[c + d*x] -
 8*a*b^2*c*d*x*Log[c + d*x] + 4*a^2*b*d^2*x*Log[c + d*x] - 4*b^3*c*d*x^2*Lo
g[c + d*x] + 2*a*b^2*d^2*x^2*Log[c + d*x]) - 3*b^2*B^2*c^2*((b*c - a*d)^2 +
 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*(b*c - a
*d)^2*Log[(e*(a + b*x))/(c + d*x)] + 4*d*(-(b*c) + a*d)*(a + b*x)*Log[(e*(a
 + b*x))/(c + d*x)] - 4*d^2*(a + b*x)^2*Log[a + b*x]*Log[(e*(a + b*x))/(c +
 d*x)] + 2*(b*c - a*d)^2*Log[(e*(a + b*x))/(c + d*x)]^2 + 2*d^2*(a + b*x)^2
*Log[c + d*x] - 4*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a
+ b*x)*Log[c + d*x]) - 4*d^2*(a + b*x)^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(
b*c - a*d)/(b*c + b*d*x)] + 2*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] -
 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a
*d)]) + 2*d^2*(a + b*x)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*
x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])) + 6*A*B*d^2*(2*(b*c - a*d)^2*(a + b*x)^2*Log[a/b + x
]^2 + 8*a*(b*c - a*d)^2*(a + b*x)*(1 + Log[a/b + x]) - a^2*(b*c - a*d)^2*(1
 + 2*Log[a/b + x]) - 2*(b*c - a*d)^2*(a*(3*a + 4*b*x) + 2*(a + b*x)^2*Log[a
 + b*x])*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)]) + 8*a
*(b*c - a*d)*(a + b*x)*((-(b*c) + a*d)*Log[c/d + x] + d*(a + b*x)*(Log[a +
b*x] - Log[c + d*x])) + 2*a^2*((b*c - a*d)^2*Log[c/d + x] + d*(a + b*x)*(b*
c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x])) - 4*(b*c -
a*d)^2*(a + b*x)^2*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])) - 6*b*B^2*c*d*(4*(b*c - a*d)^2*(a + b*x)*
(2 + 2*Log[a/b + x] + Log[a/b + x]^2) - a*(b*c - a*d)^2*(1 + 2*Log[a/b + x]
 + 2*Log[a/b + x]^2) + 2*(b*c - a*d)^2*(a + 2*b*x)*(-Log[a/b + x] + Log[c/d
 + x] + Log[(e*(a + b*x))/(c + d*x)])^2 - 2*(Log[a/b + x] - Log[c/d + x] -
Log[(e*(a + b*x))/(c + d*x)])*(4*(b*c - a*d)^2*(a + b*x)*(1 + Log[a/b + x])
 - a*(b*c - a*d)^2*(1 + 2*Log[a/b + x]) - 4*(b*c - a*d)*(a + b*x)*((b*c - a
```

```
*d)*Log[c/d + x] - d*(a + b*x)*(Log[a + b*x] - Log[c + d*x])) + 2*a*((b*c -
 a*d)^2*Log[c/d + x] + d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] -
d*(a + b*x)*Log[c + d*x]))) + 4*(b*c - a*d)*(a + b*x)*(d*(a + b*x)*Log[a/b
+ x]^2 + 2*((-(b*c) + a*d)*Log[c/d + x] + d*(a + b*x)*(Log[a + b*x] - Log[c
 + d*x])) - 2*Log[a/b + x]*((b*c - a*d)*Log[c/d + x] + d*(a + b*x)*Log[(b*(
c + d*x))/(b*c - a*d)]) - 2*d*(a + b*x)*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) - 2*a*(d*(-(b*c) + a*d)*(a + b*x) - (b*c - a*d)^2*(1 + 2*Log[a/b + x
])*Log[c/d + x] - d^2*(a + b*x)^2*Log[a + b*x] + d^2*(a + b*x)^2*Log[c + d*
x] - d*(a + b*x)*(d*(a + b*x)*Log[a/b + x]^2 + 2*(b*c - a*d)*(1 + Log[a/b +
 x]) - 2*d*(a + b*x)*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog
[2, (d*(a + b*x))/(-(b*c) + a*d)]))) + 4*(b*c - a*d)*(a + b*x)*(Log[c/d + x
]*(b*(c + d*x)*Log[c/d + x] - 2*d*(a + b*x)*Log[(d*(a + b*x))/(-(b*c) + a*d
)]) - 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*a*(2*d*(-(b*
c) + a*d)*(a + b*x)*Log[c/d + x] - (b*c - a*d)^2*Log[c/d + x]^2 + d^2*(a +
b*x)^2*Log[c/d + x]^2 + 2*d^2*(a + b*x)^2*Log[a + b*x] - 2*d^2*(a + b*x)^2*
Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*d^2*(a + b*x)^2*Log[c +
d*x] - 2*d^2*(a + b*x)^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B^2*d^2*
(4*(b*c - a*d)^2*(a + b*x)^2*Log[a/b + x]^3 + 24*a*(b*c - a*d)^2*(a + b*x)*
(2 + 2*Log[a/b + x] + Log[a/b + x]^2) - 3*a^2*(b*c - a*d)^2*(1 + 2*Log[a/b
+ x] + 2*Log[a/b + x]^2) + 6*(b*c - a*d)^2*(a*(3*a + 4*b*x) + 2*(a + b*x)^2
*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)]
)^2 + 24*a*(b*c - a*d)*(a + b*x)*(Log[c/d + x]*(b*(c + d*x)*Log[c/d + x] -
2*d*(a + b*x)*Log[(d*(a + b*x))/(-(b*c) + a*d)]) - 2*d*(a + b*x)*PolyLog[2,
 (b*(c + d*x))/(b*c - a*d)]) + 6*a^2*(2*d*(-(b*c) + a*d)*(a + b*x)*Log[c/d
+ x] - (b*c - a*d)^2*Log[c/d + x]^2 + d^2*(a + b*x)^2*Log[c/d + x]^2 + 2*d^
2*(a + b*x)^2*Log[a + b*x] - 2*d^2*(a + b*x)^2*Log[c/d + x]*Log[(d*(a + b*x
))/(-(b*c) + a*d)] - 2*d^2*(a + b*x)^2*Log[c + d*x] - 2*d^2*(a + b*x)^2*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)]) - 6*(Log[a/b + x] - Log[c/d + x] - Log[
(e*(a + b*x))/(c + d*x)])*(2*(b*c - a*d)^2*(a + b*x)^2*Log[a/b + x]^2 + 8*a
*(b*c - a*d)^2*(a + b*x)*(1 + Log[a/b + x]) - a^2*(b*c - a*d)^2*(1 + 2*Log[
a/b + x]) - 8*a*(b*c - a*d)*(a + b*x)*((b*c - a*d)*Log[c/d + x] - d*(a + b*
x)*(Log[a + b*x] - Log[c + d*x])) + 2*a^2*((b*c...
```

Maple [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{(bgx+ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="maxima")
```

```
[Out] A*B*c*d*(2*(2*b*x + a)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^4*g^3*x^2 +
2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((
b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3
*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a
^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d
 + a^2*b^2*d^2)*g^3)) - 1/2*A^2*d^2*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a*b
^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) - 1/2*A*B*c^2*((2*b*d*x
 - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x
+ (a^2*b^2*c - a^3*b*d)*g^3) - 2*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^3*
g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b
^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2
*b*d^2)*g^3)) + (2*b*x + a)*A^2*c*d/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*
g^3) + 1/2*A^2*c^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 1/2*(4*(b^2*
c*d - a*b*d^2)*B^2*x + (b^2*c^2 + 2*a*b*c*d - 3*a^2*d^2)*B^2 - 2*(B^2*b^2*d
^2*x^2 + 2*B^2*a*b*d^2*x + B^2*a^2*d^2)*log(b*x + a))*log(d*x + c)^2/(b^5*g
^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + integrate(-(3*B^2*b^3*c^2*d*x + B^2
*b^3*c^3 + (2*A*B*b^3*d^3 + B^2*b^3*d^3)*x^3 + (2*A*B*b^3*c*d^2 + 3*B^2*b^3
*c*d^2)*x^2 + (B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*b^3*c^2*d*x +
B^2*b^3*c^3)*log(b*x + a)^2 + 2*(3*B^2*b^3*c^2*d*x + B^2*b^3*c^3 + (A*B*b^3
*d^3 + B^2*b^3*d^3)*x^3 + (A*B*b^3*c*d^2 + 3*B^2*b^3*c*d^2)*x^2)*log(b*x +
a) - ((5*b^3*c^2*d - 6*a*b^2*c*d^2 + 7*a^2*b*d^3)*B^2*x + 2*(A*B*b^3*d^3 +
B^2*b^3*d^3)*x^3 + (2*b^3*c^3 - a*b^2*c^2*d - 2*a^2*b*c*d^2 + 3*a^3*d^3)*B^
2 + 2*(A*B*b^3*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*B^2)*x^2 + 2*(2*B^2*b^3*d^
3*x^3 + 3*(b^3*c*d^2 + a*b^2*d^3)*B^2*x^2 + 3*(b^3*c^2*d + a^2*b*d^3)*B^2*x
 + (b^3*c^3 + a^3*d^3)*B^2)*log(b*x + a))*log(d*x + c))/(b^6*d*g^3*x^4 + a^
3*b^3*c*g^3 + (b^6*c*g^3 + 3*a*b^5*d*g^3)*x^3 + 3*(a*b^5*c*g^3 + a^2*b^4*d*
g^3)*x^2 + (3*a^2*b^4*c*g^3 + a^3*b^3*d*g^3)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="fricas")
```

```
[Out] integral(-(A^2*d^2*x^2 + 2*A^2*c*d*x + A^2*c^2 + (B^2*d^2*x^2 + 2*B^2*c*d*x
 + B^2*c^2)*log((b*x + a)*e/(d*x + c))^2 + 2*(A*B*d^2*x^2 + 2*A*B*c*d*x + A
*B*c^2)*log((b*x + a)*e/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*
b*g^3*x + a^3*g^3), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{(a\,g+b\,g\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
3,x)
```

```
[Out] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
3, x)
```

3.71 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=147

$$-\frac{2B^2i^2(c+dx)^3}{27(bc-ad)g^4(a+bx)^3}-\frac{2Bi^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9(bc-ad)g^4(a+bx)^3}-\frac{i^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3(bc-ad)g^4(a+bx)^3}$$

```
[Out] -2/27*B^2*i^2*(d*x+c)^3/(-a*d+b*c)/g^4/(b*x+a)^3-2/9*B*i^2*(d*x+c)^3*(A+B*l
n(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)/g^4/(b*x+a)^3-1/3*i^2*(d*x+c)^3*(A+B*ln(e*
(b*x+a)/(d*x+c)))^2/(-a*d+b*c)/g^4/(b*x+a)^3
```

Rubi [A]
time = 0.12, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {2562, 2342, 2341}

$$-\frac{i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)}-\frac{2Bi^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)}-\frac{2B^2i^2(c+dx)^3}{27g^4(a+bx)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
4,x]
```

```
[Out] (-2*B^2*i^2*(c + d*x)^3)/(27*(b*c - a*d)*g^4*(a + b*x)^3) - (2*B*i^2*(c + d
*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)*g^4*(a + b*x)^3)
 - (i^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)*
g^4*(a + b*x)^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
```

```
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(71c+71dx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx = \int \left(\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^4(a+bx)^4} + \frac{10082d(bc-a}{b}\right.$$

$$= \frac{(5041d^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}\,dx}{b^2g^4} + \frac{(10082d(bc-ad))\int \frac{(A+B}{}}{b^2g^4}$$

$$= -\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{5041d(bc-ad)\,(}{b^3g^4}$$

$$= -\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{5041d(bc-ad)\,(}{b^3g^4}$$

$$= -\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{5041d(bc-ad)\,(}{b^3g^4}$$

$$= -\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{5041d(bc-ad)\,(}{b^3g^4}$$

$$= -\frac{10082B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^3g^4(a+bx)^3} - \frac{10082Bd(bc-}{3}$$

$$= -\frac{10082B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^3g^4(a+bx)^3} - \frac{10082Bd(bc-}{3}$$

$$= -\frac{10082B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^3g^4(a+bx)^3} - \frac{10082Bd(bc-}{3}$$

$$= -\frac{10082B^2(bc-ad)^2}{27b^3g^4(a+bx)^3} - \frac{10082B^2d(bc-ad)}{9b^3g^4(a+bx)^2} - \frac{10082B^2d^2}{9b^3g^4(a+bx)}$$

$$= -\frac{10082B^2(bc-ad)^2}{27b^3g^4(a+bx)^3} - \frac{10082B^2d(bc-ad)}{9b^3g^4(a+bx)^2} - \frac{10082B^2d^2}{9b^3g^4(a+bx)}$$

$$= -\frac{10082B^2(bc-ad)^2}{27b^3g^4(a+bx)^3} - \frac{10082B^2d(bc-ad)}{9b^3g^4(a+bx)^2} - \frac{10082B^2d^2}{9b^3g^4(a+bx)}$$

$$= -\frac{10082B^2(bc-ad)^2}{27b^3g^4(a+bx)^3} - \frac{10082B^2d(bc-ad)}{9b^3g^4(a+bx)^2} - \frac{10082B^2d^2}{9b^3g^4(a+bx)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order

3 in optimal.
time = 1.23, size = 1355, normalized size = 9.22

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^4,x]
```

```
[Out] -1/54*(i^2*(18*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 54*d*
(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 54*d^2*(-(
b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 54*B*d^2*(
a + b*x)^2*(2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d*(a + b
*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*d*(a + b*x)*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 2*B*(b*c - a*d + d*(a + b*x)
*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*(a + b*x)*(Log[a + b*x]*(Lo
g[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))
/(-(b*c) + a*d)]) + B*d*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - L
og[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 27*
B*d*(a + b*x)*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(
-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b
*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2
*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c -
 a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d
)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2
*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x
] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c)
+ a*d)]) - 2*B*d^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B*(12*
(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a
+ b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^
2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b
*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d)
^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*
(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b
*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^
3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b
*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c
) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - L
og[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(b^
3*(b*c - a*d)*g^4*(a + b*x)^3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 366 vs.

2(141) = 282.
time = 0.70, size = 367, normalized size = 2.50 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/3*i^2*d^2*e^2/(a*d-b*c)^2/g^4*A^2/(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^3+2*i^2*d^2*e^2/(a*d-b*c)^2/g^4*A*B*(-1/3/(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^3)+i^2*d^2*e^2/(a*d-b*c)^2/g^4*B^2*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))-2/27/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3))
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 5514 vs. 2(134) = 268.
time = 0.83, size = 5514, normalized size = 37.51

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, alg
orithm="maxima")
```

```
[Out] 1/3*(3*b*x + a)*B^2*c*d*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^4*x^3
 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + 1/3*(3*b^2*x^2 + 3*a*
b*x + a^2)*B^2*d^2*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^4*x^3 + 3*
a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + 1/54*(6*((6*b^2*d^2*x^2 +
2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 -
 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^
3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3
*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 -
 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b
^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log(b*x*e/(d*x
+ c) + a*e/(d*x + c)) + (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*
a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^
2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3
*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*
c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x
 + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*
d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3
*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*g^4 +
3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^4 + 3*
a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b^5*c^2
*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*g^4 -
3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2*c^2 +
```

```
1/54*(6*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2
)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c
*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4
*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 -
 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b
^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2
 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^
2*d^3)*g^4))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + (19*a*b^3*c^3 - 189*a^2
*b^2*c^2*d + 189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - 32*a*b^3*c*d^
2 + 5*a^2*b^2*d^3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3
*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*
b*d^3)*x)*log(b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b
^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^
3*b*d^3)*x)*log(d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + 135*a^2*b^2*c
*d^2 - 19*a^3*b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*
a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*b^2*c*d
^2 - 5*a^3*b*d^3)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4
*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*
a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2
- a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2
 - a^3*b*d^3)*x)*log(b*x + a))*log(d*x + c))/(a^3*b^5*c^3*g^4 - 3*a^4*b^4*c
^2*d*g^4 + 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^4 - 3*a*b^7*c
^2*d*g^4 + 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b^7*c^3*g^4 -
3*a^2*b^6*c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x^2 + 3*(a^2*b
^6*c^3*g^4 - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b^3*d^3*g^4)*x
))*B^2*c*d + 1/54*(6*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*
c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a
^3*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2
- 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a
^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3
*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d
+ 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*
d^3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3
)*g^4))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + (85*a^2*b^3*c^3 - 108*a^3*b^
2*c^2*d + 27*a^4*b*c*d^2 - 4*a^5*d^3 + 6*(18*b^5*c^3 - 27*a*b^4*c^2*d + 11*
a^2*b^3*c*d^2 - 2*a^3*b^2*d^3)*x^2 - 18*(3*a^3*b^2*c^2*d - 3*a^4*b*c*d^2 +
a^5*d^3 + (3*b^5*c^2*d - 3*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 3*(3*a*b^4*c^2*
d - 3*a^2*b^3*c*d^2 + a^3*b^2*d^3)*x^2 + 3*(3*a^2*b^3*c^2*d - 3*a^3*b^2*c*d
^2 + a^4*b*d^3)*x)*log(b*x + a)^2 - 18*(3*a^3*b^2*c^2*d - 3*a^4*b*c*d^2 + a
^5*d^3 + (3*b^5*c^2*d - 3*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 3*(3*a*b^4*c^2*d
 - 3*a^2*b^3*c*d^2 + a^3*b^2*d^3)*x^2 + 3*(3*a^2*b^3*c^2*d - 3*a^3*b^2*c*d^
2 + a^4*b*d^3)*x)*log(d*x + c)^2 + 3*(63*a*b^4*c^3 - 86*a^2*b^3*c^2*d + 27*
a^3*b^2*c*d^2 - 4*a^4*b*d^3)*x + 6*(18*a^3*b^2*c^2*d - 9*a^4*b*c*d^2 + 2*a^
5*d^3 + (18*b^5*c^2*d - 9*a*b^4*c*d^2 + 2*a^2*b^3*d^3)*x^3 + 3*(18*a*b^4*c^
2*d - 9*a^2*b^3*c*d^2 + 2*a^3*b^2*d^3)*x^2 + 3*...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 407 vs. $2(134) = 268$.
time = 0.37, size = 407, normalized size = 2.77

$$\frac{(9A^2+6AB+2B^2)b^3c^3-(9A^2+6AB+2B^2)a^3d^3+3\left((9A^2+6AB+2B^2)b^3cd^2-(9A^2+6AB+2B^2)ab^2d^3\right)x^2+9\left(B^2b^3d^3x^3+3B^2b^3cd^2x^2+3B^2b^3c^2dx+B^2b^3c^3\right)\log\left(\frac{(bx+a)e}{dx+c}\right)^2+3\left((9A^2+6AB+2B^2)b^3c^2d-(9A^2+6AB+2B^2)a^2bd^3\right)x+6\left((3AB+B^2)b^3d^3x^3+3(3AB+B^2)b^3cd^2x^2+3(3AB+B^2)b^3c^2dx+(3AB+B^2)b^3c^3\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{27\left((b^7c-ab^6d)g^4x^3+3(ab^6c-a^2b^5d)g^4x^2+3(a^2b^5c-a^3b^4d)g^4x+(a^3b^4c-a^4b^3d)g^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, alg
orithm="fricas")
```

```
[Out] 1/27*((9*A^2 + 6*A*B + 2*B^2)*b^3*c^3 - (9*A^2 + 6*A*B + 2*B^2)*a^3*d^3 + 3
*((9*A^2 + 6*A*B + 2*B^2)*b^3*c*d^2 - (9*A^2 + 6*A*B + 2*B^2)*a*b^2*d^3)*x^
2 + 9*(B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*b^3*c^2*d*x + B^2*b^3*
c^3)*log((b*x + a)*e/(d*x + c))^2 + 3*((9*A^2 + 6*A*B + 2*B^2)*b^3*c^2*d -
(9*A^2 + 6*A*B + 2*B^2)*a^2*b*d^3)*x + 6*((3*A*B + B^2)*b^3*d^3*x^3 + 3*(3*
A*B + B^2)*b^3*c*d^2*x^2 + 3*(3*A*B + B^2)*b^3*c^2*d*x + (3*A*B + B^2)*b^3*
c^3)*log((b*x + a)*e/(d*x + c)))/((b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*b^6*c -
a^2*b^5*d)*g^4*x^2 + 3*(a^2*b^5*c - a^3*b^4*d)*g^4*x + (a^3*b^4*c - a^4*b^3
*d)*g^4)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 1182 vs. $2(131) = 262$.
time = 35.43, size = 1182, normalized size = 8.04

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4,x)
```

```
[Out] -2*B*d**3*i**2*(3*A + B)*log(x + (6*A*B*a*d**4*i**2 + 6*A*B*b*c*d**3*i**2 +
 2*B**2*a*d**4*i**2 + 2*B**2*b*c*d**3*i**2 - 2*B*a**2*d**5*i**2*(3*A + B)/(
a*d - b*c) + 4*B*a*b*c*d**4*i**2*(3*A + B)/(a*d - b*c) - 2*B*b**2*c**2*d**3
*i**2*(3*A + B)/(a*d - b*c))/(12*A*B*b*d**4*i**2 + 4*B**2*b*d**4*i**2))/(9*
b**3*g**4*(a*d - b*c)) + 2*B*d**3*i**2*(3*A + B)*log(x + (6*A*B*a*d**4*i**2
 + 6*A*B*b*c*d**3*i**2 + 2*B**2*a*d**4*i**2 + 2*B**2*b*c*d**3*i**2 + 2*B*a*
*2*d**5*i**2*(3*A + B)/(a*d - b*c) - 4*B*a*b*c*d**4*i**2*(3*A + B)/(a*d - b
*c) + 2*B*b**2*c**2*d**3*i**2*(3*A + B)/(a*d - b*c))/(12*A*B*b*d**4*i**2 +
4*B**2*b*d**4*i**2))/(9*b**3*g**4*(a*d - b*c)) + (B**2*c**3*i**2 + 3*B**2*c
**2*d*i**2*x + 3*B**2*c*d**2*i**2*x**2 + B**2*d**3*i**2*x**3)*log(e*(a + b*
x)/(c + d*x))**2/(3*a**4*d*g**4 - 3*a**3*b*c*g**4 + 9*a**3*b*d*g**4*x - 9*a
**2*b**2*c*g**4*x + 9*a**2*b**2*d*g**4*x**2 - 9*a*b**3*c*g**4*x**2 + 3*a*b*
*3*d*g**4*x**3 - 3*b**4*c*g**4*x**3) + (-9*A**2*a**2*d**2*i**2 - 9*A**2*a*b
*c*d*i**2 - 9*A**2*b**2*c**2*i**2 - 6*A*B*a**2*d**2*i**2 - 6*A*B*a*b*c*d*i*
*2 - 6*A*B*b**2*c**2*i**2 - 2*B**2*a**2*d**2*i**2 - 2*B**2*a*b*c*d*i**2 - 2
*B**2*b**2*c**2*i**2 + x**2*(-27*A**2*b**2*d**2*i**2 - 18*A*B*b**2*d**2*i**
```

```
2 - 6*B**2*b**2*d**2*i**2) + x*(-27*A**2*a*b*d**2*i**2 - 27*A**2*b**2*c*d*i
**2 - 18*A*B*a*b*d**2*i**2 - 18*A*B*b**2*c*d*i**2 - 6*B**2*a*b*d**2*i**2 -
6*B**2*b**2*c*d*i**2))/(27*a**3*b**3*g**4 + 81*a**2*b**4*g**4*x + 81*a*b**5
*g**4*x**2 + 27*b**6*g**4*x**3) + (-6*A*B*a**2*d**2*i**2 - 6*A*B*a*b*c*d*i*
*2 - 18*A*B*a*b*d**2*i**2*x - 6*A*B*b**2*c**2*i**2 - 18*A*B*b**2*c*d*i**2*x
 - 18*A*B*b**2*d**2*i**2*x**2 - 2*B**2*a**2*d**2*i**2 - 2*B**2*a*b*c*d*i**2
 - 6*B**2*a*b*d**2*i**2*x - 2*B**2*b**2*c**2*i**2 - 6*B**2*b**2*c*d*i**2*x
- 6*B**2*b**2*d**2*i**2*x**2)*log(e*(a + b*x)/(c + d*x))/(9*a**3*b**3*g**4
+ 27*a**2*b**4*g**4*x + 27*a*b**5*g**4*x**2 + 9*b**6*g**4*x**3)
```

Giac [A]
time = 2.90, size = 180, normalized size = 1.22

$$\frac{\left(9\,B^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)^2+18\,ABe^4\log\left(\frac{bxe+ae}{dx+c}\right)+6\,B^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)+9\,A^2e^4+6\,ABe^4+2\,B^2e^4\right)(dx+c)^3\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{27\,(bxe+ae)^3g^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, alg
orithm="giac")
```

```
[Out] 1/27*(9*B^2*e^4*log((b*x*e + a*e)/(d*x + c))^2 + 18*A*B*e^4*log((b*x*e + a*
e)/(d*x + c)) + 6*B^2*e^4*log((b*x*e + a*e)/(d*x + c)) + 9*A^2*e^4 + 6*A*B*
e^4 + 2*B^2*e^4)*(d*x + c)^3*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c
*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^3*g^4)
```

Mupad [B]
time = 7.41, size = 1153, normalized size = 7.84

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
4,x)
```

```
[Out] - (x^2*(9*A^2*b^2*d^2*i^2 + 2*B^2*b^2*d^2*i^2 + 6*A*B*b^2*d^2*i^2) + x*(9*A
^2*a*b*d^2*i^2 + 2*B^2*a*b*d^2*i^2 + 9*A^2*b^2*c*d*i^2 + 2*B^2*b^2*c*d*i^2
+ 6*A*B*a*b*d^2*i^2 + 6*A*B*b^2*c*d*i^2) + 3*A^2*a^2*d^2*i^2 + 3*A^2*b^2*c^
2*i^2 + (2*B^2*a^2*d^2*i^2)/3 + (2*B^2*b^2*c^2*i^2)/3 + 2*A*B*a^2*d^2*i^2 +
 2*A*B*b^2*c^2*i^2 + 3*A^2*a*b*c*d*i^2 + (2*B^2*a*b*c*d*i^2)/3 + 2*A*B*a*b*
c*d*i^2)/(9*a^3*b^3*g^4 + 9*b^6*g^4*x^3 + 27*a^2*b^4*g^4*x + 27*a*b^5*g^4*x
^2) - log((e*(a + b*x))/(c + d*x))^2*((x*(b*((B^2*c*d*i^2)/(3*b^3*g^4) + (B
^2*a*d^2*i^2)/(3*b^4*g^4)) + (2*B^2*c*d*i^2)/(3*b^2*g^4) + (2*B^2*a*d^2*i^2
)/(3*b^3*g^4)) + a*((B^2*c*d*i^2)/(3*b^3*g^4) + (B^2*a*d^2*i^2)/(3*b^4*g^4)
) + (B^2*c^2*i^2)/(3*b^2*g^4) + (B^2*d^2*i^2*x^2)/(b^2*g^4))/(3*a^2*x + a^3
/b + b^2*x^3 + 3*a*b*x^2) - (B^2*d^3*i^2)/(3*b^3*g^4*(a*d - b*c))) - (log((
e*(a + b*x))/(c + d*x))*(x*(b*((B*i^2*(2*A*b*c - B*a*d + B*b*c))/(3*b^4*g^4
```

```
) + (2*A*B*a*d*i^2)/(3*b^4*g^4)) + (2*B*i^2*(2*A*b*c - B*a*d + B*b*c))/(3*b
^3*g^4) + (2*B^2*d^3*i^2*(b*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(6*b*d^3) +
(a*(a*d - b*c))/(3*b*d^2)) + (3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(3*d^3) + (2
*a*(a*d - b*c))/(3*d^2)))/(3*b^3*g^4*(a*d - b*c)) + (4*A*B*a*d*i^2)/(3*b^3*
g^4)) + x^2*((2*A*B*d*i^2)/(b^2*g^4) - (2*B^2*d^3*i^2*((b^2*c - a*b*d)/(3*d
^2) - (2*b*(a*d - b*c))/(3*d^2)))/(3*b^3*g^4*(a*d - b*c))) + a*((B*i^2*(2*A
*b*c - B*a*d + B*b*c))/(3*b^4*g^4) + (2*A*B*a*d*i^2)/(3*b^4*g^4)) + (2*B*i^
2*(A*b^2*c^2 - B*a^2*d^2 + B*a*b*c*d))/(3*b^4*d*g^4) + (2*B^2*d^3*i^2*(a*((
3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(3*b*d^2)) + (
3*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d^2)/(3*b*d^4)))/(3*b^3*g^4
*(a*d - b*c))))/((3*a^2*x)/d + a^3/(b*d) + (b^2*x^3)/d + (3*a*b*x^2)/d) - (
B*d^3*i^2*atan((((9*b^4*c*g^4 + 9*a*b^3*d*g^4)/(9*b^3*g^4) + 2*b*d*x)*1i)/(
a*d - b*c))*(3*A + B)*4i)/(9*b^3*g^4*(a*d - b*c))
```

3.72 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=299

$$\frac{2B^2di^2(c+dx)^3}{27(bc-ad)^2g^5(a+bx)^3}-\frac{bB^2i^2(c+dx)^4}{32(bc-ad)^2g^5(a+bx)^4}+\frac{2Bdi^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9(bc-ad)^2g^5(a+bx)^3}-\frac{bBi^2(c+dx)^4}{8(bc-$$

```
[Out] 2/27*B^2*d*i^2*(d*x+c)^3/(-a*d+b*c)^2/g^5/(b*x+a)^3-1/32*b*B^2*i^2*(d*x+c)^
4/(-a*d+b*c)^2/g^5/(b*x+a)^4+2/9*B*d*i^2*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c
)))/(-a*d+b*c)^2/g^5/(b*x+a)^3-1/8*b*B*i^2*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x
+c)))/(-a*d+b*c)^2/g^5/(b*x+a)^4+1/3*d*i^2*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x
+c)))^2/(-a*d+b*c)^2/g^5/(b*x+a)^3-1/4*b*i^2*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d
*x+c)))^2/(-a*d+b*c)^2/g^5/(b*x+a)^4
```

Rubi [A]
time = 0.20, antiderivative size = 299, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2562, 2395, 2342, 2341}

$$-\frac{bi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^2}-\frac{bBi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^2}+\frac{di^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^5(a+bx)^3(bc-ad)^2}+\frac{2Bdi^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^5(a+bx)^3(bc-ad)^2}-\frac{bB^2i^2(c+dx)^4}{32g^5(a+bx)^4(bc-ad)^2}+\frac{2B^2di^2(c+dx)^3}{27g^5(a+bx)^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
5,x]
```

```
[Out] (2*B^2*d*i^2*(c + d*x)^3)/(27*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*B^2*i^2*(
c + d*x)^4)/(32*(b*c - a*d)^2*g^5*(a + b*x)^4) + (2*B*d*i^2*(c + d*x)^3*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*B
*i^2*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)^2*g^5
*(a + b*x)^4) + (d*i^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(3*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*i^2*(c + d*x)^4*(A + B*Log[(e*(a + b
*x))/(c + d*x)])^2)/(4*(b*c - a*d)^2*g^5*(a + b*x)^4)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(72c+72dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx = \int \left(\frac{5184(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^5(a+bx)^5} + \frac{10368d(bc-}{}\right.$$

$$= \frac{(5184d^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^3}\,dx}{b^2g^5} + \frac{(10368d(bc-ad))\int \frac{(A+}{}}{b^2g^5}$$

$$= -\frac{1296(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{3456d(bc-ad)}{b^3g}$$

$$= -\frac{1296(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{3456d(bc-ad)}{b^3g}$$

$$= -\frac{1296(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{3456d(bc-ad)}{b^3g}$$

$$= -\frac{1296(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{3456d(bc-ad)}{b^3g}$$

$$= -\frac{648B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{1440Bd(bc-a}{b^3}$$

$$= -\frac{648B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{1440Bd(bc-a}{b^3}$$

$$= -\frac{648B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{1440Bd(bc-a}{b^3}$$

$$= -\frac{162B^2(bc-ad)^2}{b^3g^5(a+bx)^4} - \frac{264B^2d(bc-ad)}{b^3g^5(a+bx)^3} + \frac{180B^2d^2}{b^3g^5(a+bx)^2} +$$

$$= -\frac{162B^2(bc-ad)^2}{b^3g^5(a+bx)^4} - \frac{264B^2d(bc-ad)}{b^3g^5(a+bx)^3} + \frac{180B^2d^2}{b^3g^5(a+bx)^2} +$$

$$= -\frac{162B^2(bc-ad)^2}{b^3g^5(a+bx)^4} - \frac{264B^2d(bc-ad)}{b^3g^5(a+bx)^3} + \frac{180B^2d^2}{b^3g^5(a+bx)^2} +$$

$$= -\frac{162B^2(bc-ad)^2}{b^3g^5(a+bx)^4} - \frac{264B^2d(bc-ad)}{b^3g^5(a+bx)^3} + \frac{180B^2d^2}{b^3g^5(a+bx)^2} +$$

Mathematica [**C**] Result contains higher order function than in optimal. Order 4 vs. order

3 in optimal.
time = 1.86, size = 1788, normalized size = 5.98

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^5,x]
```

```
[Out] -1/864*(i^2*(216*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 576
*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 432*
d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 216*
B*d^2*(a + b*x)^2*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4
*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a
 + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*
x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b
*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c -
 a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2
*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a +
 b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)]) - 2*B*d^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 32
*B*d*(a + b*x)*(12*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*
d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*
c - a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x
)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*
(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b
*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a
+ b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Lo
g[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(
b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*
Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[
a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (
d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/
(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(
b*c - a*d)])) + 3*B*(36*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
+ 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 72
*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d
^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 144*d^
4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^4*(
a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 144*B*d^3*(a
 + b*x)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x])
 + 36*B*d^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d
^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*(a +
b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a
```

```
+ b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x])
 + 3*B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d
)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Lo
g[a + b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*(a + b*x)^4*(Log[a
 + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d
*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*(a + b*x)^4*((2*Log[(d*(a + b*x))/(
-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)]))))/(b^3*(b*c - a*d)^2*g^5*(a + b*x)^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 721 vs. $2(287) = 574$.
time = 0.79, size = 722, normalized size = 2.41 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/4*i^2*d^2*e^3/(a*d-b*c)^3/g^5*A^2*b/(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^4-1/3*i^2*d^3*e^2/(a*d-b*c)^3/g^5*A^2/(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^3-2*i^2*d^2*e^3/(a*d-b*c)^3/g^5*A*B*b*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x
+c))^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/16/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4
)+2*i^2*d^3*e^2/(a*d-b*c)^3/g^5*A*B*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)-i^2*d^2
*e^3/(a*d-b*c)^3/g^5*B^2*b*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^2-1/8/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))-1/32/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4)+i^2*d^3*e^2/(a*d-b*c
)^3/g^5*B^2*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^2-2/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)-2/27/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 8013 vs. $2(273) = 546$.
time = 1.16, size = 8013, normalized size = 26.80

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="maxima")
```

```
[Out] 1/6*(4*b*x + a)*B^2*c*d*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^5*x^4
 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + 1
/12*(6*b^2*x^2 + 4*a*b*x + a^2)*B^2*d^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)
)^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x +
a^4*b^3*g^5) - 1/288*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23
*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d
```

- 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*
d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d
^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*
d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c
*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^
2 - a^7*b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2
*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^
5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^
5))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 21
6*a^2*b^2*c^2*d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*
d^4)*x^3 + 6*(13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*
(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^
4)*log(b*x + a)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 +
4*a^3*b*d^4*x + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^
2 + 324*a^2*b^2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x
^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4
*d^4*x^4 + 100*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a
^4*d^4 - 12*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^
4*x + a^4*d^4)*log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3
*d*g^5 + 6*a^6*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9
*c^4*g^5 - 4*a*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5
+ a^4*b^5*d^4*g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6
*c^2*d^2*g^5 - 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*
g^5 - 4*a^3*b^6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a
^6*b^3*d^4*g^5)*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*
c^2*d^2*g^5 - 4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2*c^2 + 1/432*(1
2*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^
4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)
x^2 + 4(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/
((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b
^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*
b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3
*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^
5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d
^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*
a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b
^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)
*g^5))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + (37*a*b^4*c^4 - 304*a^2*b^3*c
^3*d + 1512*a^3*b^2*c^2*d^2 - 1360*a^4*b*c*d^3 + 115*a^5*d^4 + 12*(88*b^5*c
^2*d^2 - 101*a*b^4*c*d^3 + 13*a^2*b^3*d^4)*x^3 - 6*(40*b^5*c^3*d - 609*a*b^
4*c^2*d^2 + 648*a^2*b^3*c*d^3 - 79*a^3*b^2*d^4)*x^2 - 72*(4*a^4*b*c*d^3 - a
^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^
3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)
*x)*log(b*x + a)^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4
)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*

```
d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(d*x + c)^2 + 4*(16*b^5*c^
4 - 163*a*b^4*c^3*d + 1068*a^2*b^3*c^2*d^2 - 1036*a^3*b^2*c*d^3 + 115*a^4*b
*d^4)*x + 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x
^4 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3
*b^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x)*log(b*x + a) - 12*(8
8*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4 + 4*(88*a*b^
4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4)*x^2 +
 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x - 12*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b
^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*
b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(b*x +
 a))*log(d*x + c))/(a^4*b^6*c^4*g^5 - 4*a^5*b^5*c^3*d*g^5 + 6*a^6*b^4*c^2*d
^2*g^5 - 4*a^7*b^3*c*d^3*g^5 + a^8*b^2*d^4*g^5 + (b^10*c^4*g^5 - 4*a*b^9*c^
3*d*g^5 + 6*a^2*b^8*c^2*d^2*g^5 - 4*a^3*b^7*c*d^3*g^5 + a^4*b^6*d^4*g^5)*x^
4 + 4*(a*b^9*c^4*g^5 - 4*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7*c^2*d^2*g^5 - 4*a^4*
b^6*c*d^3*g^5 + a^5*b^5*d^4*g^5)*x^3 + 6*(a^2*b^8*c^4*g^5 - 4*a^3*b^7*c^3*d
*g^5 + 6*a^4*b^6*c^2*d^2*g^5 - 4*a^5*b^5*c*d^3*...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 784 vs. $2(273) = 546$.
time $= 0.41$, size $= 784$, normalized size $= 2.62$

$$\frac{27\,(8\,A^2+4\,AB+B^2)b^4c^4-32\,(9\,A^2+6\,AB+2\,B^2)ab^3c^3d+(72\,A^2+84\,AB+37\,B^2)a^4d^4-12\,((12\,AB+7\,B^2)b^4cd^3-(12\,AB+7\,B^2)ab^3d^4)x^3+6\,((72\,A^2+12\,AB-5\,B^2)b^4c^2d^2-16\,(9\,A^2+6\,AB+2\,B^2)ab^3cd^3+(72\,A^2+84\,AB+37\,B^2)a^2b^2d^4)x^2-72\,(B^2b^4d^4x^4+4\,B^2ab^3d^4x^3-3\,B^2b^4c^4+4\,B^2ab^3c^3d-6\,(B^2b^4c^2d^2-2\,B^2ab^3cd^3)x^2-4\,(2\,B^2b^4c^3d-3\,B^2ab^3c^2d^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)^2+4\,((144\,A^2+60\,AB+11\,B^2)b^4c^3d-24\,(9\,A^2+6\,AB+2\,B^2)ab^3c^2d^2+(72\,A^2+84\,AB+37\,B^2)a^3bd^4)x-12\,((12\,AB+7\,B^2)b^4d^4x^4-9\,(4\,AB+B^2)b^4c^4+16\,(3\,AB+B^2)ab^3c^3d+4\,(3\,B^2b^4cd^3+4\,(3\,AB+B^2)ab^3d^4)x^3-6\,((12\,AB+B^2)b^4c^2d^2-8\,(3\,AB+B^2)ab^3cd^3)x^2-4\,((24\,AB+5\,B^2)b^4c^3d-12\,(3\,AB+B^2)ab^3c^2d^2)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{864\,((b^9c^2-2\,ab^8cd+a^2b^7d^2)g^5x^4+4\,(ab^8c^2-2\,a^2b^7cd+a^3b^6d^2)g^5x^3+6\,(a^2b^7c^2-2\,a^3b^6cd+a^4b^5d^2)g^5x^2+4\,(a^3b^6c^2-2\,a^4b^5cd+a^5b^4d^2)g^5x+(a^4b^5c^2-2\,a^5b^4cd+a^6b^3d^2)g^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="fricas")
```

```
[Out] 1/864*(27*(8*A^2 + 4*A*B + B^2)*b^4*c^4 - 32*(9*A^2 + 6*A*B + 2*B^2)*a*b^3*
c^3*d + (72*A^2 + 84*A*B + 37*B^2)*a^4*d^4 - 12*((12*A*B + 7*B^2)*b^4*c*d^3
 - (12*A*B + 7*B^2)*a*b^3*d^4)*x^3 + 6*((72*A^2 + 12*A*B - 5*B^2)*b^4*c^2*d
^2 - 16*(9*A^2 + 6*A*B + 2*B^2)*a*b^3*c*d^3 + (72*A^2 + 84*A*B + 37*B^2)*a^
2*b^2*d^4)*x^2 - 72*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 - 3*B^2*b^4*c^4
+ 4*B^2*a*b^3*c^3*d - 6*(B^2*b^4*c^2*d^2 - 2*B^2*a*b^3*c*d^3)*x^2 - 4*(2*B^
2*b^4*c^3*d - 3*B^2*a*b^3*c^2*d^2)*x)*log((b*x + a)*e/(d*x + c))^2 + 4*((14
4*A^2 + 60*A*B + 11*B^2)*b^4*c^3*d - 24*(9*A^2 + 6*A*B + 2*B^2)*a*b^3*c^2*d
^2 + (72*A^2 + 84*A*B + 37*B^2)*a^3*b*d^4)*x - 12*((12*A*B + 7*B^2)*b^4*d^4
*x^4 - 9*(4*A*B + B^2)*b^4*c^4 + 16*(3*A*B + B^2)*a*b^3*c^3*d + 4*(3*B^2*b^
4*c*d^3 + 4*(3*A*B + B^2)*a*b^3*d^4)*x^3 - 6*((12*A*B + B^2)*b^4*c^2*d^2 -
8*(3*A*B + B^2)*a*b^3*c*d^3)*x^2 - 4*((24*A*B + 5*B^2)*b^4*c^3*d - 12*(3*A*
B + B^2)*a*b^3*c^2*d^2)*x)*log((b*x + a)*e/(d*x + c)))/((b^9*c^2 - 2*a*b^8*
c*d + a^2*b^7*d^2)*g^5*x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^3*b^6*d^2)*g^
5*x^3 + 6*(a^2*b^7*c^2 - 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2 + 4*(a^3*b^6*
c^2 - 2*a^4*b^5*c*d + a^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^5*b^4*c*d + a
^6*b^3*d^2)*g^5)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 2055 vs. $2(277) = 554$.

time = 86.91, size = 2055, normalized size = 6.87

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] -B*d**4*i**2*(12*A + 7*B)*log(x + (12*A*B*a*d**5*i**2 + 12*A*B*b*c*d**4*i**
2 + 7*B**2*a*d**5*i**2 + 7*B**2*b*c*d**4*i**2 - B*a**3*d**7*i**2*(12*A + 7*
B)/(a*d - b*c)**2 + 3*B*a**2*b*c*d**6*i**2*(12*A + 7*B)/(a*d - b*c)**2 - 3*
B*a*b**2*c**2*d**5*i**2*(12*A + 7*B)/(a*d - b*c)**2 + B*b**3*c**3*d**4*i**2
*(12*A + 7*B)/(a*d - b*c)**2)/(24*A*B*b*d**5*i**2 + 14*B**2*b*d**5*i**2))/(
72*b**3*g**5*(a*d - b*c)**2) + B*d**4*i**2*(12*A + 7*B)*log(x + (12*A*B*a*d
**5*i**2 + 12*A*B*b*c*d**4*i**2 + 7*B**2*a*d**5*i**2 + 7*B**2*b*c*d**4*i**2
 + B*a**3*d**7*i**2*(12*A + 7*B)/(a*d - b*c)**2 - 3*B*a**2*b*c*d**6*i**2*(1
2*A + 7*B)/(a*d - b*c)**2 + 3*B*a*b**2*c**2*d**5*i**2*(12*A + 7*B)/(a*d - b
*c)**2 - B*b**3*c**3*d**4*i**2*(12*A + 7*B)/(a*d - b*c)**2)/(24*A*B*b*d**5*
i**2 + 14*B**2*b*d**5*i**2))/(72*b**3*g**5*(a*d - b*c)**2) + (4*B**2*a*c**3
*d*i**2 + 12*B**2*a*c**2*d**2*i**2*x + 12*B**2*a*c*d**3*i**2*x**2 + 4*B**2*
a*d**4*i**2*x**3 - 3*B**2*b*c**4*i**2 - 8*B**2*b*c**3*d*i**2*x - 6*B**2*b*c
**2*d**2*i**2*x**2 + B**2*b*d**4*i**2*x**4)*log(e*(a + b*x)/(c + d*x))**2/(
12*a**6*d**2*g**5 - 24*a**5*b*c*d*g**5 + 48*a**5*b*d**2*g**5*x + 12*a**4*b*
*2*c**2*g**5 - 96*a**4*b**2*c*d*g**5*x + 72*a**4*b**2*d**2*g**5*x**2 + 48*a
**3*b**3*c**2*g**5*x - 144*a**3*b**3*c*d*g**5*x**2 + 48*a**3*b**3*d**2*g**5
*x**3 + 72*a**2*b**4*c**2*g**5*x**2 - 96*a**2*b**4*c*d*g**5*x**3 + 12*a**2*
b**4*d**2*g**5*x**4 + 48*a*b**5*c**2*g**5*x**3 - 24*a*b**5*c*d*g**5*x**4 +
12*b**6*c**2*g**5*x**4) + (-12*A*B*a**3*d**3*i**2 - 12*A*B*a**2*b*c*d**2*i*
*2 - 48*A*B*a**2*b*d**3*i**2*x - 12*A*B*a*b**2*c**2*d*i**2 - 48*A*B*a*b**2*
c*d**2*i**2*x - 72*A*B*a*b**2*d**3*i**2*x**2 + 36*A*B*b**3*c**3*i**2 + 96*A
*B*b**3*c**2*d*i**2*x + 72*A*B*b**3*c*d**2*i**2*x**2 - 7*B**2*a**3*d**3*i**
2 - 7*B**2*a**2*b*c*d**2*i**2 - 28*B**2*a**2*b*d**3*i**2*x - 7*B**2*a*b**2*
c**2*d*i**2 - 28*B**2*a*b**2*c*d**2*i**2*x - 42*B**2*a*b**2*d**3*i**2*x**2
+ 9*B**2*b**3*c**3*i**2 + 20*B**2*b**3*c**2*d*i**2*x + 6*B**2*b**3*c*d**2*i
**2*x**2 - 12*B**2*b**3*d**3*i**2*x**3)*log(e*(a + b*x)/(c + d*x))/(72*a**5
*b**3*d*g**5 - 72*a**4*b**4*c*g**5 + 288*a**4*b**4*d*g**5*x - 288*a**3*b**5
*c*g**5*x + 432*a**3*b**5*d*g**5*x**2 - 432*a**2*b**6*c*g**5*x**2 + 288*a**
2*b**6*d*g**5*x**3 - 288*a*b**7*c*g**5*x**3 + 72*a*b**7*d*g**5*x**4 - 72*b*
*8*c*g**5*x**4) + (-72*A**2*a**3*d**3*i**2 - 72*A**2*a**2*b*c*d**2*i**2 - 7
2*A**2*a*b**2*c**2*d*i**2 + 216*A**2*b**3*c**3*i**2 - 84*A*B*a**3*d**3*i**2
 - 84*A*B*a**2*b*c*d**2*i**2 - 84*A*B*a*b**2*c**2*d*i**2 + 108*A*B*b**3*c**
3*i**2 - 37*B**2*a**3*d**3*i**2 - 37*B**2*a**2*b*c*d**2*i**2 - 37*B**2*a*b*
*2*c**2*d*i**2 + 27*B**2*b**3*c**3*i**2 + x**3*(-144*A*B*b**3*d**3*i**2 - 8
4*B**2*b**3*d**3*i**2) + x**2*(-432*A**2*a*b**2*d**3*i**2 + 432*A**2*b**3*c
*d**2*i**2 - 504*A*B*a*b**2*d**3*i**2 + 72*A*B*b**3*c*d**2*i**2 - 222*B**2*
a*b**2*d**3*i**2 - 30*B**2*b**3*c*d**2*i**2) + x*(-288*A**2*a**2*b*d**3*i**
```

```
2 - 288*A**2*a*b**2*c*d**2*i**2 + 576*A**2*b**3*c**2*d*i**2 - 336*A*B*a**2*
b*d**3*i**2 - 336*A*B*a*b**2*c*d**2*i**2 + 240*A*B*b**3*c**2*d*i**2 - 148*B
**2*a**2*b*d**3*i**2 - 148*B**2*a*b**2*c*d**2*i**2 + 44*B**2*b**3*c**2*d*i*
*2))/(864*a**5*b**3*d*g**5 - 864*a**4*b**4*c*g**5 + x**4*(864*a*b**7*d*g**5
 - 864*b**8*c*g**5) + x**3*(3456*a**2*b**6*d*g**5 - 3456*a*b**7*c*g**5) + x
**2*(5184*a**3*b**5*d*g**5 - 5184*a**2*b**6*c*g**5) + x*(3456*a**4*b**4*d*g
**5 - 3456*a**3*b**5*c*g**5))
```

Giac [A]
time = 3.98, size = 425, normalized size = 1.42

$$\frac{\left(216\,B^2be^5\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{288\,(bxe+ae)B^2de^4\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+432\,ABbe^5\log\left(\frac{bxe+ae}{dx+c}\right)+108\,B^2be^5\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{576\,(bxe+ae)ABde^4\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{192\,(bxe+ae)B^2de^4\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+216\,A^2be^5+108\,ABbe^5+27\,B^2be^5-\frac{288\,(bxe+ae)A^2de^4}{dx+c}-\frac{192\,(bxe+ae)ABde^4}{dx+c}-\frac{64\,(bxe+ae)B^2de^4}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{864\left(\frac{(bxe+ae)^4bcg^5}{(dx+c)^4}-\frac{(bxe+ae)^4adg^5}{(dx+c)^4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="giac")
```

```
[Out] 1/864*(216*B^2*b*e^5*log((b*x*e + a*e)/(d*x + c))^2 - 288*(b*x*e + a*e)*B^2
*d*e^4*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 432*A*B*b*e^5*log((b*x*e
+ a*e)/(d*x + c)) + 108*B^2*b*e^5*log((b*x*e + a*e)/(d*x + c)) - 576*(b*x*e
 + a*e)*A*B*d*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 192*(b*x*e + a*e
)*B^2*d*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 216*A^2*b*e^5 + 108*A*
B*b*e^5 + 27*B^2*b*e^5 - 288*(b*x*e + a*e)*A^2*d*e^4/(d*x + c) - 192*(b*x*e
 + a*e)*A*B*d*e^4/(d*x + c) - 64*(b*x*e + a*e)*B^2*d*e^4/(d*x + c))*(b*c/((
b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e +
a*e)^4*b*c*g^5/(d*x + c)^4 - (b*x*e + a*e)^4*a*d*g^5/(d*x + c)^4)
```

Mupad [B]
time = 11.20, size = 1940, normalized size = 6.49

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
5,x)
```

```
[Out] - log((e*(a + b*x))/(c + d*x))^2*((x*(b*((B^2*c*d*i^2)/(6*b^3*g^5) + (B^2*a
*d^2*i^2)/(12*b^4*g^5)) + (B^2*c*d*i^2)/(2*b^2*g^5) + (B^2*a*d^2*i^2)/(4*b^
3*g^5)) + a*((B^2*c*d*i^2)/(6*b^3*g^5) + (B^2*a*d^2*i^2)/(12*b^4*g^5)) + (B
^2*c^2*i^2)/(4*b^2*g^5) + (B^2*d^2*i^2*x^2)/(2*b^2*g^5))/(4*a^3*x + a^4/b +
 b^3*x^4 + 6*a^2*b*x^2 + 4*a*b^2*x^3) - (B^2*d^4*i^2)/(12*b^3*g^5*(a^2*d^2
+ b^2*c^2 - 2*a*b*c*d))) - ((72*A^2*a^3*d^3*i^2 - 216*A^2*b^3*c^3*i^2 + 37*
B^2*a^3*d^3*i^2 - 27*B^2*b^3*c^3*i^2 + 84*A*B*a^3*d^3*i^2 - 108*A*B*b^3*c^3
*i^2 + 72*A^2*a*b^2*c^2*d*i^2 + 72*A^2*a^2*b*c*d^2*i^2 + 37*B^2*a*b^2*c^2*d
*i^2 + 37*B^2*a^2*b*c*d^2*i^2 + 84*A*B*a*b^2*c^2*d*i^2 + 84*A*B*a^2*b*c*d^2
```

```
*i^2)/(12*(a*d - b*c)) + (x^3*(7*B^2*b^3*d^3*i^2 + 12*A*B*b^3*d^3*i^2))/(a*
d - b*c) + (x*(72*A^2*a^2*b*d^3*i^2 + 37*B^2*a^2*b*d^3*i^2 - 144*A^2*b^3*c^
2*d*i^2 - 11*B^2*b^3*c^2*d*i^2 + 72*A^2*a*b^2*c*d^2*i^2 + 37*B^2*a*b^2*c*d^
2*i^2 + 84*A*B*a^2*b*d^3*i^2 - 60*A*B*b^3*c^2*d*i^2 + 84*A*B*a*b^2*c*d^2*i^
2))/(3*(a*d - b*c)) + (x^2*(72*A^2*a*b^2*d^3*i^2 + 37*B^2*a*b^2*d^3*i^2 - 7
2*A^2*b^3*c*d^2*i^2 + 5*B^2*b^3*c*d^2*i^2 + 84*A*B*a*b^2*d^3*i^2 - 12*A*B*b
^3*c*d^2*i^2))/(2*(a*d - b*c)))/(72*a^4*b^3*g^5 + 72*b^7*g^5*x^4 + 288*a^3*
b^4*g^5*x + 288*a*b^6*g^5*x^3 + 432*a^2*b^5*g^5*x^2) - (log((e*(a + b*x))/(
c + d*x))*(x^2*((A*B*d*i^2)/(b^2*g^5) + (B^2*d^4*i^2*(b*(b*((4*a^2*d^2 + b^
2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) + (4*a^2*d^2 + b
^2*c^2 - 5*a*b*c*d)/(6*d^3) + (a*(a*d - b*c))/(2*d^2)) - a*((b^2*c - a*b*d)
/(4*d^2) - (b*(a*d - b*c))/(2*d^2)) + (b^3*c^2 + 4*a^2*b*d^2 - 5*a*b^2*c*d)
/(4*d^3)))/(6*b^3*g^5*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) + a*((B*i^2*(4*A*b*
c - B*a*d + B*b*c))/(12*b^4*g^5) + (A*B*a*d*i^2)/(6*b^4*g^5)) + x*(b*((B*i^
2*(4*A*b*c - B*a*d + B*b*c))/(12*b^4*g^5) + (A*B*a*d*i^2)/(6*b^4*g^5)) + (B
*i^2*(4*A*b*c - B*a*d + B*b*c))/(4*b^3*g^5) + (B^2*d^4*i^2*(b*(a*((4*a^2*d^
2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) + (6*a^3*d
^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(12*b*d^4)) + a*(b*((4*a^2*d
^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) + (4*a^2*
d^2 + b^2*c^2 - 5*a*b*c*d)/(6*d^3) + (a*(a*d - b*c))/(2*d^2)) + (6*a^3*d^3
- b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(4*d^4)))/(6*b^3*g^5*(a^2*d^2 +
 b^2*c^2 - 2*a*b*c*d)) + (A*B*a*d*i^2)/(2*b^3*g^5)) + (B*i^2*(6*A*b^2*c^2 -
 2*B*a^2*d^2 + B*b^2*c^2 + B*a*b*c*d))/(12*b^4*d*g^5) + (B^2*d^4*i^2*(a*(a*
((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2))
+ (6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(12*b*d^4)) + (4*a
^4*d^4 + b^4*c^4 + 10*a^2*b^2*c^2*d^2 - 5*a*b^3*c^3*d - 10*a^3*b*c*d^3)/(4*
b*d^5)))/(6*b^3*g^5*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (B^2*d^4*i^2*x^3*(b*
((b^2*c - a*b*d)/(4*d^2) - (b*(a*d - b*c))/(2*d^2)) + (b^3*c - a*b^2*d)/(4*
d^2)))/(6*b^3*g^5*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))))/((4*a^3*x)/d + a^4/(b*
d) + (b^3*x^4)/d + (6*a^2*b*x^2)/d + (4*a*b^2*x^3)/d) - (B*d^4*i^2*atan(((2
*b*d*x - (72*b^5*c^2*g^5 - 72*a^2*b^3*d^2*g^5)/(72*b^3*g^5*(a*d - b*c)))*1i
)/(a*d - b*c))*(12*A + 7*B)*1i)/(36*b^3*g^5*(a*d - b*c)^2)
```

3.73 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=463

$$-\frac{2B^2d^2i^2(c+dx)^3}{27(bc-ad)^3g^6(a+bx)^3}+\frac{bB^2di^2(c+dx)^4}{16(bc-ad)^3g^6(a+bx)^4}-\frac{2b^2B^2i^2(c+dx)^5}{125(bc-ad)^3g^6(a+bx)^5}-\frac{2Bd^2i^2(c+dx)^3\left(A+B\right.}{9(bc-ad)^3g^6(a\ldots}$$

```
[Out] -2/27*B^2*d^2*i^2*(d*x+c)^3/(-a*d+b*c)^3/g^6/(b*x+a)^3+1/16*b*B^2*d*i^2*(d*
x+c)^4/(-a*d+b*c)^3/g^6/(b*x+a)^4-2/125*b^2*B^2*i^2*(d*x+c)^5/(-a*d+b*c)^3/
g^6/(b*x+a)^5-2/9*B*d^2*i^2*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c
)^3/g^6/(b*x+a)^3+1/4*b*B*d*i^2*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d
+b*c)^3/g^6/(b*x+a)^4-2/25*b^2*B*i^2*(d*x+c)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))/
(-a*d+b*c)^3/g^6/(b*x+a)^5-1/3*d^2*i^2*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c))
)^2/(-a*d+b*c)^3/g^6/(b*x+a)^3+1/2*b*d*i^2*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x
+c)))^2/(-a*d+b*c)^3/g^6/(b*x+a)^4-1/5*b^2*i^2*(d*x+c)^5*(A+B*ln(e*(b*x+a)/
(d*x+c)))^2/(-a*d+b*c)^3/g^6/(b*x+a)^5
```

Rubi [A]
time = 0.28, antiderivative size = 463, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2562, 2395, 2342, 2341}

$$-\frac{b^2i^2(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{5g^6(a+bx)^5(bc-ad)^3}-\frac{2b^2Bi^2(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{25g^6(a+bx)^5(bc-ad)^3}-\frac{d^2i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^6(a+bx)^3(bc-ad)^3}-\frac{2Bd^2i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^6(a+bx)^3(bc-ad)^3}+\frac{bdi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^6(a+bx)^4(bc-ad)^3}+\frac{bBdi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^6(a+bx)^4(bc-ad)^3}-\frac{2b^2B^2i^2(c+dx)^5}{125g^6(a+bx)^5(bc-ad)^3}-\frac{2B^2d^2i^2(c+dx)^3}{27g^6(a+bx)^3(bc-ad)^3}+\frac{bB^2di^2(c+dx)^4}{16g^6(a+bx)^4(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
6,x]
```

```
[Out] (-2*B^2*d^2*i^2*(c + d*x)^3)/(27*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B^2*d*
i^2*(c + d*x)^4)/(16*(b*c - a*d)^3*g^6*(a + b*x)^4) - (2*b^2*B^2*i^2*(c + d
*x)^5)/(125*(b*c - a*d)^3*g^6*(a + b*x)^5) - (2*B*d^2*i^2*(c + d*x)^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B*d
*i^2*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*(b*c - a*d)^3*g^6
*(a + b*x)^4) - (2*b^2*B*i^2*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(25*(b*c - a*d)^3*g^6*(a + b*x)^5) - (d^2*i^2*(c + d*x)^3*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*d*i^2*(c
+ d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^3*g^6*(a +
b*x)^4) - (b^2*i^2*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*(
b*c - a*d)^3*g^6*(a + b*x)^5)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
```

```
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(73c+73dx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx = \int \left(\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^6(a+bx)^6} + \frac{10658d(bc-$$

$$= \frac{(5329d^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^4}\,dx}{b^2g^6} + \frac{(10658d(bc-ad))\int \frac{(A+}{}}{b^2g^6}$$

$$= -\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{5329d(bc-ad)}{2b^3}$$

$$= -\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{5329d(bc-ad)}{2b^3}$$

$$= -\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{5329d(bc-ad)}{2b^3}$$

$$= -\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{5329d(bc-ad)}{2b^3}$$

$$= -\frac{10658B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^3g^6(a+bx)^5} - \frac{15987Bd(bc-}{2}$$

$$= -\frac{10658B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^3g^6(a+bx)^5} - \frac{15987Bd(bc-}{2}$$

$$= -\frac{10658B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^3g^6(a+bx)^5} - \frac{15987Bd(bc-}{2}$$

$$= -\frac{10658B^2(bc-ad)^2}{125b^3g^6(a+bx)^5} - \frac{37303B^2d(bc-ad)}{400b^3g^6(a+bx)^4} + \frac{229147B^2}{2700b^3g^6(a+}$$

$$= -\frac{10658B^2(bc-ad)^2}{125b^3g^6(a+bx)^5} - \frac{37303B^2d(bc-ad)}{400b^3g^6(a+bx)^4} + \frac{229147B^2}{2700b^3g^6(a+}$$

$$= -\frac{10658B^2(bc-ad)^2}{125b^3g^6(a+bx)^5} - \frac{37303B^2d(bc-ad)}{400b^3g^6(a+bx)^4} + \frac{229147B^2}{2700b^3g^6(a+}$$

$$= -\frac{10658B^2(bc-ad)^2}{125b^3g^6(a+bx)^5} - \frac{37303B^2d(bc-ad)}{400b^3g^6(a+bx)^4} + \frac{229147B^2}{2700b^3g^6(a+}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order

3 in optimal.
time = 2.48, size = 2220, normalized size = 4.79

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^6,x]
```

```
[Out] -1/54000*(i^2*(10800*(b*c - a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
 27000*d*(b*c - a*d)^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 1
8000*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^
2 + 1000*B*d^2*(a + b*x)^2*(12*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])
+ 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*
d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*
(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a
 + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x])
 - 9*B*d*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a
 + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*
d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*
(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a +
b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*
PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d
*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])) + 375*B*d*(a + b*x)*(36*(b*c - a*d)^4*(A + B*Log[
(e*(a + b*x))/(c + d*x)]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(
a + b*x))/(c + d*x)]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x
))/(c + d*x)]) + 144*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*L
og[c + d*x] - 144*B*d^3*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x] -
 d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b
*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*L
og[c + d*x]) - 8*B*d*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*
x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3
*(a + b*x)^3*Log[c + d*x]) + 3*B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a
 + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)
^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 7
2*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
- a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*(a + b*x)
^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*P
olyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 6*B*(-225*a*B*d*(b*c - a*d)^4 + 14
4*B*(b*c - a*d)^5 - 225*b*B*d*(b*c - a*d)^4*x + 300*a*B*d^2*(b*c - a*d)^3*(
a + b*x) - 180*B*d*(b*c - a*d)^4*(a + b*x) + 300*b*B*d^2*(b*c - a*d)^3*x*(a
```

```
 + b*x) - 450*a*B*d^3*(b*c - a*d)^2*(a + b*x)^2 + 640*B*d^2*(b*c - a*d)^3*(
a + b*x)^2 - 450*b*B*d^3*(b*c - a*d)^2*x*(a + b*x)^2 + 900*a*B*d^4*(b*c - a
*d)*(a + b*x)^3 - 1860*B*d^3*(b*c - a*d)^2*(a + b*x)^3 + 900*b*B*d^4*(b*c -
 a*d)*x*(a + b*x)^3 + 3600*b*B*c*d^4*(a + b*x)^4 - 3600*a*B*d^5*(a + b*x)^4
 + 3720*B*d^4*(b*c - a*d)*(a + b*x)^4 + 900*a*B*d^5*(a + b*x)^4*Log[a + b*x
] + 900*b*B*d^5*x*(a + b*x)^4*Log[a + b*x] + 7320*B*d^5*(a + b*x)^5*Log[a +
 b*x] + 720*(b*c - a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 900*d*(b*c
 - a*d)^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 1200*d^2*(b*c -
a*d)^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 1800*d^3*(b*c - a
*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 3600*d^4*(b*c - a*
d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 3600*d^5*(a + b*x)^5*
Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 900*a*B*d^5*(a + b*x)^4
*Log[c + d*x] - 900*b*B*d^5*x*(a + b*x)^4*Log[c + d*x] - 7320*B*d^5*(a + b*
x)^5*Log[c + d*x] - 3600*d^5*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)
])*Log[c + d*x] - 1800*B*d^5*(a + b*x)^5*(Log[a + b*x]*(Log[a + b*x] - 2*Lo
g[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
 + 1800*B*d^5*(a + b*x)^5*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d
*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(b^3*(b*c -
 a*d)^3*g^6*(a + b*x)^5)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1081 vs. $2(445) = 890$.

time = 0.92, size = 1082, normalized size = 2.34 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/5*i^2*d^2*e^4/(a*d-b*c)^4/g^6*A^2*b^2/(b*e/d+(a*d-b*
c)*e/d/(d*x+c))^5+1/2*i^2*d^3*e^3/(a*d-b*c)^4/g^6*A^2*b/(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^4-1/3*i^2*d^4*e^2/(a*d-b*c)^4/g^6*A^2/(b*e/d+(a*d-b*c)*e/d/(d*x+
c))^3+2*i^2*d^2*e^4/(a*d-b*c)^4/g^6*A*B*b^2*(-1/5/(b*e/d+(a*d-b*c)*e/d/(d*x
+c))^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/25/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5
)-4*i^2*d^3*e^3/(a*d-b*c)^4/g^6*A*B*b*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/16/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4)+2*i^
2*d^4*e^2/(a*d-b*c)^4/g^6*A*B*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-1/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)+i^2*d^2*e^4/(
a*d-b*c)^4/g^6*B^2*b^2*(-1/5/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))^2-2/25/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))-2/125/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5)-2*i^2*d^3*e^3/(a*d-b*c
)^4/g^6*B^2*b*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2-1/8/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))-1/32/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4)+i^2*d^4*e^2/(a*d-b*c)^4/g^6*B^2*(
-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2/9/
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2/27/(b*e/d
+(a*d-b*c)*e/d/(d*x+c))^3))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 10862 vs. $2(424) = 848$.
time = 1.64, size = 10862, normalized size = 23.46

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="maxima")
```

```
[Out] 1/10*(5*b*x + a)*B^2*c*d*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^7*g^6*x^
5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g
^6*x + a^5*b^2*g^6) + 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*B^2*d^2*log(b*x*e/(
d*x + c) + a*e/(d*x + c))^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6
*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + 1/9000*(60*((6
0*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3
*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d
^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d
^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2
*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^
2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 +
10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a
^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2
 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*
d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4
 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6)
+ 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a
^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((
b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b
^2*c*d^4 - a^5*b*d^5)*g^6))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + (144*b^5
*c^5 - 1125*a*b^4*c^4*d + 4000*a^2*b^3*c^3*d^2 - 9000*a^3*b^2*c^2*d^3 + 180
00*a^4*b*c*d^4 - 12019*a^5*d^5 + 8220*(b^5*c*d^4 - a*b^4*d^5)*x^4 - 30*(77*
b^5*c^2*d^3 - 1250*a*b^4*c*d^4 + 1173*a^2*b^3*d^5)*x^3 + 10*(94*b^5*c^3*d^2
 - 975*a*b^4*c^2*d^3 + 6600*a^2*b^3*c*d^4 - 5719*a^3*b^2*d^5)*x^2 - 1800*(b
^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*
a^4*b*d^5*x + a^5*d^5)*log(b*x + a)^2 - 1800*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4
 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(d
*x + c)^2 - 5*(81*b^5*c^4*d - 700*a*b^4*c^3*d^2 + 3000*a^2*b^3*c^2*d^3 - 10
800*a^3*b^2*c*d^4 + 8419*a^4*b*d^5)*x + 8220*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4
 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b
*x + a) - 60*(137*b^5*d^5*x^5 + 685*a*b^4*d^5*x^4 + 1370*a^2*b^3*d^5*x^3 +
1370*a^3*b^2*d^5*x^2 + 685*a^4*b*d^5*x + 137*a^5*d^5 - 60*(b^5*d^5*x^5 + 5*
a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a
^5*d^5)*log(b*x + a))*log(d*x + c))/(a^5*b^6*c^5*g^6 - 5*a^6*b^5*c^4*d*g^6
+ 10*a^7*b^4*c^3*d^2*g^6 - 10*a^8*b^3*c^2*d^3*g^6 + 5*a^9*b^2*c*d^4*g^6 - a
```

```
^10*b*d^5*g^6 + (b^11*c^5*g^6 - 5*a*b^10*c^4*d*g^6 + 10*a^2*b^9*c^3*d^2*g^6
 - 10*a^3*b^8*c^2*d^3*g^6 + 5*a^4*b^7*c*d^4*g^6 - a^5*b^6*d^5*g^6)*x^5 + 5*
(a*b^10*c^5*g^6 - 5*a^2*b^9*c^4*d*g^6 + 10*a^3*b^8*c^3*d^2*g^6 - 10*a^4*b^7
*c^2*d^3*g^6 + 5*a^5*b^6*c*d^4*g^6 - a^6*b^5*d^5*g^6)*x^4 + 10*(a^2*b^9*c^5
*g^6 - 5*a^3*b^8*c^4*d*g^6 + 10*a^4*b^7*c^3*d^2*g^6 - 10*a^5*b^6*c^2*d^3*g^
6 + 5*a^6*b^5*c*d^4*g^6 - a^7*b^4*d^5*g^6)*x^3 + 10*(a^3*b^8*c^5*g^6 - 5*a^
4*b^7*c^4*d*g^6 + 10*a^5*b^6*c^3*d^2*g^6 - 10*a^6*b^5*c^2*d^3*g^6 + 5*a^7*b
^4*c*d^4*g^6 - a^8*b^3*d^5*g^6)*x^2 + 5*(a^4*b^7*c^5*g^6 - 5*a^5*b^6*c^4*d*
g^6 + 10*a^6*b^5*c^3*d^2*g^6 - 10*a^7*b^4*c^2*d^3*g^6 + 5*a^8*b^3*c*d^4*g^6
 - a^9*b^2*d^5*g^6)*x))*B^2*c^2 + 1/18000*(60*((27*a*b^4*c^4 - 148*a^2*b^3*
c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^
3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^
3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^
4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2
*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 -
 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d +
 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c
^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g
^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*
c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5
*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*
c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c
*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 -
 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 -
 a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^
3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6))*log(b*x*e/(d*x + c) +
a*e/(d*x + c)) + (549*a*b^5*c^5 - 4625*a^2*b^4*c^4*d + 19000*a^3*b^3*c^3*d^
2 - 63000*a^4*b^2*c^2*d^3 + 51875*a^5*b*c*d^4 - 3799*a^6*d^5 - 60*(625*b^6*
c^2*d^3 - 702*a*b^5*c*d^4 + 77*a^2*b^4*d^5)*x^4 + 30*(325*b^6*c^3*d^2 - 566
7*a*b^5*c^2*d^3 + 5975*a^2*b^4*c*d^4 - 633*a^3*b^3*d^5)*x^3 - 10*(350*b^6*c
^4*d - 3949*a*b^5*c^3*d^2 + 29475*a^2*b^4*c^2*d^3 - 28775*a^3*b^3*c*d^4 + 2
899*a^4*b^2*d^5)*x^2 + 1800*(5*a^5*b*c*d^4 - a^...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 1264 vs. $2(424) = 848$.
time = 0.45, size = 1264, normalized size = 2.73

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="fricas")
```

```
[Out] 1/54000*(432*(25*A^2 + 10*A*B + 2*B^2)*b^5*c^5 - 3375*(8*A^2 + 4*A*B + B^2)
*a*b^4*c^4*d + 2000*(9*A^2 + 6*A*B + 2*B^2)*a^2*b^3*c^3*d^2 - (1800*A^2 + 2
```

```
820*A*B + 1489*B^2)*a^5*d^5 + 60*((60*A*B + 47*B^2)*b^5*c*d^4 - (60*A*B + 4
7*B^2)*a*b^4*d^5)*x^4 - 30*((60*A*B - 13*B^2)*b^5*c^2*d^3 - 50*(12*A*B + 7*
B^2)*a*b^4*c*d^4 + 3*(180*A*B + 121*B^2)*a^2*b^3*d^5)*x^3 + 10*(2*(900*A^2
+ 60*A*B - 43*B^2)*b^5*c^3*d^2 - 75*(72*A^2 + 12*A*B - 5*B^2)*a*b^4*c^2*d^3
 + 600*(9*A^2 + 6*A*B + 2*B^2)*a^2*b^3*c*d^4 - (1800*A^2 + 2820*A*B + 1489*
B^2)*a^3*b^2*d^5)*x^2 + 1800*(B^2*b^5*d^5*x^5 + 5*B^2*a*b^4*d^5*x^4 + 10*B^
2*a^2*b^3*d^5*x^3 + 6*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 10*B^2*a^2*b^3*c^3
*d^2 + 10*(B^2*b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3 + 3*B^2*a^2*b^3*c*d^4)*x^2
 + 5*(3*B^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*d^2 + 6*B^2*a^2*b^3*c^2*d^3)*x)*log
((b*x + a)*e/(d*x + c))^2 + 5*(27*(200*A^2 + 60*A*B + 7*B^2)*b^5*c^4*d - 10
0*(144*A^2 + 60*A*B + 11*B^2)*a*b^4*c^3*d^2 + 1200*(9*A^2 + 6*A*B + 2*B^2)*
a^2*b^3*c^2*d^3 - (1800*A^2 + 2820*A*B + 1489*B^2)*a^4*b*d^5)*x + 60*((60*A
*B + 47*B^2)*b^5*d^5*x^5 + 72*(5*A*B + B^2)*b^5*c^5 - 225*(4*A*B + B^2)*a*b
^4*c^4*d + 200*(3*A*B + B^2)*a^2*b^3*c^3*d^2 + 5*(12*B^2*b^5*c*d^4 + 5*(12*
A*B + 7*B^2)*a*b^4*d^5)*x^4 - 10*(3*B^2*b^5*c^2*d^3 - 30*B^2*a*b^4*c*d^4 -
20*(3*A*B + B^2)*a^2*b^3*d^5)*x^3 + 10*(2*(30*A*B + B^2)*b^5*c^3*d^2 - 15*(
12*A*B + B^2)*a*b^4*c^2*d^3 + 60*(3*A*B + B^2)*a^2*b^3*c*d^4)*x^2 + 5*(9*(2
0*A*B + 3*B^2)*b^5*c^4*d - 20*(24*A*B + 5*B^2)*a*b^4*c^3*d^2 + 120*(3*A*B +
 B^2)*a^2*b^3*c^2*d^3)*x)*log((b*x + a)*e/(d*x + c)))/((b^11*c^3 - 3*a*b^10
*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5*(a*b^10*c^3 - 3*a^2*b^9
*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 10*(a^2*b^9*c^3 - 3*a^3*b
^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 + 10*(a^3*b^8*c^3 - 3*a^4
*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2 + 5*(a^4*b^7*c^3 - 3*a^
5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x + (a^5*b^6*c^3 - 3*a^6*b
^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*g^6)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

$$\text{Timed out}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.87, size = 709, normalized size = 1.53

$$\frac{\left(10800\,B^2b^2e^6\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{27000\,(bxe+ae)B^2bde^5\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+\frac{18000\,(bxe+ae)^2B^2d^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)^2}{(dx+c)^2}+21600\,ABb^2e^6\log\left(\frac{bxe+ae}{dx+c}\right)+4320\,B^2b^2e^6\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{54000\,(bxe+ae)ABbde^5\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{13500\,(bxe+ae)B^2bde^5\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{36000\,(bxe+ae)^2ABd^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+\frac{12000\,(bxe+ae)^2B^2d^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+10800\,A^2b^2e^6+4320\,ABb^2e^6+864\,B^2b^2e^6-\frac{27000\,(bxe+ae)A^2bde^5}{dx+c}-\frac{13500\,(bxe+ae)ABbde^5}{dx+c}-\frac{3375\,(bxe+ae)B^2bde^5}{dx+c}+\frac{18000\,(bxe+ae)^2A^2d^2e^4}{(dx+c)^2}+\frac{12000\,(bxe+ae)^2ABd^2e^4}{(dx+c)^2}+\frac{4000\,(bxe+ae)^2B^2d^2e^4}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{54000\left(\frac{(bxe+ae)^5b^2c^2g^6}{(dx+c)^5}-\frac{2\,(bxe+ae)^5abcdg^6}{(dx+c)^5}+\frac{(bxe+ae)^5a^2d^2g^6}{(dx+c)^5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="giac")
```

```
[Out] 1/54000*(10800*B^2*b^2*e^6*log((b*x*e + a*e)/(d*x + c))^2 - 27000*(b*x*e +
a*e)*B^2*b*d*e^5*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 18000*(b*x*e +
a*e)^2*B^2*d^2*e^4*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^2 + 21600*A*B*b
^2*e^6*log((b*x*e + a*e)/(d*x + c)) + 4320*B^2*b^2*e^6*log((b*x*e + a*e)/(d
*x + c)) - 54000*(b*x*e + a*e)*A*B*b*d*e^5*log((b*x*e + a*e)/(d*x + c))/(d*
x + c) - 13500*(b*x*e + a*e)*B^2*b*d*e^5*log((b*x*e + a*e)/(d*x + c))/(d*x
+ c) + 36000*(b*x*e + a*e)^2*A*B*d^2*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x
+ c)^2 + 12000*(b*x*e + a*e)^2*B^2*d^2*e^4*log((b*x*e + a*e)/(d*x + c))/(d*
x + c)^2 + 10800*A^2*b^2*e^6 + 4320*A*B*b^2*e^6 + 864*B^2*b^2*e^6 - 27000*(
b*x*e + a*e)*A^2*b*d*e^5/(d*x + c) - 13500*(b*x*e + a*e)*A*B*b*d*e^5/(d*x +
 c) - 3375*(b*x*e + a*e)*B^2*b*d*e^5/(d*x + c) + 18000*(b*x*e + a*e)^2*A^2*
d^2*e^4/(d*x + c)^2 + 12000*(b*x*e + a*e)^2*A*B*d^2*e^4/(d*x + c)^2 + 4000*
(b*x*e + a*e)^2*B^2*d^2*e^4/(d*x + c)^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d))
 - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^5*b^2*c^2*g^6/(d*x + c
)^5 - 2*(b*x*e + a*e)^5*a*b*c*d*g^6/(d*x + c)^5 + (b*x*e + a*e)^5*a^2*d^2*g
^6/(d*x + c)^5)
```

Mupad [B]
time = 12.77, size = 2500, normalized size = 5.40

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
6,x)
```

```
[Out] ((1800*A^2*a^4*d^4*i^2 + 10800*A^2*b^4*c^4*i^2 + 1489*B^2*a^4*d^4*i^2 + 864
*B^2*b^4*c^4*i^2 + 2820*A*B*a^4*d^4*i^2 + 4320*A*B*b^4*c^4*i^2 - 16200*A^2*
a*b^3*c^3*d*i^2 + 1800*A^2*a^3*b*c*d^3*i^2 - 2511*B^2*a*b^3*c^3*d*i^2 + 148
9*B^2*a^3*b*c*d^3*i^2 + 1800*A^2*a^2*b^2*c^2*d^2*i^2 + 1489*B^2*a^2*b^2*c^2
*d^2*i^2 + 2820*A*B*a^2*b^2*c^2*d^2*i^2 - 9180*A*B*a*b^3*c^3*d*i^2 + 2820*A
*B*a^3*b*c*d^3*i^2)/(60*(a*d - b*c)) + (x^3*(363*B^2*a*b^3*d^4*i^2 + 13*B^2
*b^4*c*d^3*i^2 + 540*A*B*a*b^3*d^4*i^2 - 60*A*B*b^4*c*d^3*i^2))/(2*(a*d - b
*c)) + (x*(1800*A^2*a^3*b*d^4*i^2 + 1489*B^2*a^3*b*d^4*i^2 + 5400*A^2*b^4*c
^3*d*i^2 + 189*B^2*b^4*c^3*d*i^2 - 9000*A^2*a*b^3*c^2*d^2*i^2 + 1800*A^2*a^
2*b^2*c*d^3*i^2 - 911*B^2*a*b^3*c^2*d^2*i^2 + 1489*B^2*a^2*b^2*c*d^3*i^2 +
2820*A*B*a^3*b*d^4*i^2 + 1620*A*B*b^4*c^3*d*i^2 - 4380*A*B*a*b^3*c^2*d^2*i^
2 + 2820*A*B*a^2*b^2*c*d^3*i^2))/(12*(a*d - b*c)) + (x^2*(1800*A^2*a^2*b^2*
d^4*i^2 + 1489*B^2*a^2*b^2*d^4*i^2 + 1800*A^2*b^4*c^2*d^2*i^2 - 86*B^2*b^4*
c^2*d^2*i^2 - 3600*A^2*a*b^3*c*d^3*i^2 + 289*B^2*a*b^3*c*d^3*i^2 + 2820*A*B
*a^2*b^2*d^4*i^2 + 120*A*B*b^4*c^2*d^2*i^2 - 780*A*B*a*b^3*c*d^3*i^2))/(6*(
a*d - b*c)) + (d*x^4*(47*B^2*b^4*d^3*i^2 + 60*A*B*b^4*d^3*i^2))/(a*d - b*c)
)/(x*(4500*a^4*b^5*c*g^6 - 4500*a^5*b^4*d*g^6) - x^4*(4500*a^2*b^7*d*g^6 -
4500*a*b^8*c*g^6) + x^5*(900*b^9*c*g^6 - 900*a*b^8*d*g^6) + x^2*(9000*a^3*b
^6*c*g^6 - 9000*a^4*b^5*d*g^6) + x^3*(9000*a^2*b^7*c*g^6 - 9000*a^3*b^6*d*g
```

^6) + 900*a^5*b^4*c*g^6 - 900*a^6*b^3*d*g^6) - log((e*(a + b*x))/(c + d*x))
^2*((x*(b*((B^2*c*d*i^2)/(10*b^3*g^6) + (B^2*a*d^2*i^2)/(30*b^4*g^6)) + (2*
B^2*c*d*i^2)/(5*b^2*g^6) + (2*B^2*a*d^2*i^2)/(15*b^3*g^6)) + a*((B^2*c*d*i^
2)/(10*b^3*g^6) + (B^2*a*d^2*i^2)/(30*b^4*g^6)) + (B^2*c^2*i^2)/(5*b^2*g^6)
 + (B^2*d^2*i^2*x^2)/(3*b^2*g^6))/(5*a^4*x + a^5/b + b^4*x^5 + 10*a^3*b*x^2
 + 5*a*b^3*x^4 + 10*a^2*b^2*x^3) - (B^2*d^5*i^2)/(30*b^3*g^6*(a^3*d^3 - b^3
*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) - (log((e*(a + b*x))/(c + d*x))*(a*
((B*i^2*(6*A*b*c - B*a*d + B*b*c))/(30*b^4*g^6) + (A*B*a*d*i^2)/(15*b^4*g^6
)) + x*(b*((B*i^2*(6*A*b*c - B*a*d + B*b*c))/(30*b^4*g^6) + (A*B*a*d*i^2)/(
15*b^4*g^6)) + (2*B*i^2*(6*A*b*c - B*a*d + B*b*c))/(15*b^3*g^6) + (B^2*d^5*
i^2*((10*a^4*d^4 + b^4*c^4 + 15*a^2*b^2*c^2*d^2 - 6*a*b^3*c^3*d - 20*a^3*b*
c*d^3)/(5*d^5) + b*(a*(a*((5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(20*b*d^3) + (a
*(a*d - b*c))/(5*b*d^2)) + (10*a^3*d^3 - b^3*c^3 + 6*a*b^2*c^2*d - 15*a^2*b
*c*d^2)/(30*b*d^4)) + (10*a^4*d^4 + b^4*c^4 + 15*a^2*b^2*c^2*d^2 - 6*a*b^3*
c^3*d - 20*a^3*b*c*d^3)/(20*b*d^5)) + a*(b*(a*((5*a^2*d^2 + b^2*c^2 - 6*a*b
*c*d)/(20*b*d^3) + (a*(a*d - b*c))/(5*b*d^2)) + (10*a^3*d^3 - b^3*c^3 + 6*a
*b^2*c^2*d - 15*a^2*b*c*d^2)/(30*b*d^4)) + a*(b*((5*a^2*d^2 + b^2*c^2 - 6*a
*b*c*d)/(20*b*d^3) + (a*(a*d - b*c))/(5*b*d^2)) + (5*a^2*d^2 + b^2*c^2 - 6*
a*b*c*d)/(10*d^3) + (2*a*(a*d - b*c))/(5*d^2)) + (10*a^3*d^3 - b^3*c^3 + 6*
a*b^2*c^2*d - 15*a^2*b*c*d^2)/(10*d^4))))/(15*b^3*g^6*(a^3*d^3 - b^3*c^3 +
3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (4*A*B*a*d*i^2)/(15*b^3*g^6)) + x^2*((2*A
*B*d*i^2)/(3*b^2*g^6) + (B^2*d^5*i^2*(a*(b*(b*((5*a^2*d^2 + b^2*c^2 - 6*a*b
*c*d)/(20*b*d^3) + (a*(a*d - b*c))/(5*b*d^2)) + (5*a^2*d^2 + b^2*c^2 - 6*a*
b*c*d)/(10*d^3) + (2*a*(a*d - b*c))/(5*d^2)) - a*((b^2*c - a*b*d)/(5*d^2) -
 (2*b*(a*d - b*c))/(5*d^2)) + (3*(b^3*c^2 + 5*a^2*b*d^2 - 6*a*b^2*c*d))/(20
*d^3)) - (b^4*c^3 - 10*a^3*b*d^3 + 15*a^2*b^2*c*d^2 - 6*a*b^3*c^2*d)/(5*d^4
) + b*(b*(a*((5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(20*b*d^3) + (a*(a*d - b*c))
/(5*b*d^2)) + (10*a^3*d^3 - b^3*c^3 + 6*a*b^2*c^2*d - 15*a^2*b*c*d^2)/(30*b
d^4)) + a(b*((5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(20*b*d^3) + (a*(a*d - b*c
))/(5*b*d^2)) + (5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(10*d^3) + (2*a*(a*d - b*
c))/(5*d^2)) + (10*a^3*d^3 - b^3*c^3 + 6*a*b^2*c^2*d - 15*a^2*b*c*d^2)/(10*
d^4))))/(15*b^3*g^6*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) +
 (B*i^2*(6*A*b^2*c^2 - B*a^2*d^2 + B*b^2*c^2))/(15*b^4*d*g^6) + (B^2*d^5*i^
2*(a*(a*(a*((5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(20*b*d^3) + (a*(a*d - b*c))/
(5*b*d^2)) + (10*a^3*d^3 - b^3*c^3 + 6*a*b^2*c^2*d - 15*a^2*b*c*d^2)/(30*b*
d^4)) + (10*a^4*d^4 + b^4*c^4 + 15*a^2*b^2*c^2*d^2 - 6*a*b^3*c^3*d - 20*a^3
*b*c*d^3)/(20*b*d^5)) + (5*a^5*d^5 - b^5*c^5 - 15*a^2*b^3*c^3*d^2 + 20*a^3*
b^2*c^2*d^3 + 6*a*b^4*c^4*d - 15*a^4*b*c*d^4)/(5*b*d^6)))/(15*b^3*g^6*(a^3*
d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (B^2*d^5*i^2*x^3*((b^4*c^
2 + 5*a^2*b^2*d^2 - 6*a*b^3*c*d)/(5*d^3) + b*(b*(b*((5*a^2*d^2 + b^2*c^2 -
6*a*b*c*d)/(20*b*d^3) + (a*(a*d - b*c))/(5*b*d^2)) + (5*a^2*d^2 + b^2*c^2 -
 6*a*b*c*d)/(10*d^3) + (2*a*(a*d - b*c))/(5*d^2)) - a*((b^2*c - a*b*d)/(5*d
^2) - (2*b*(a*d - b*c))/(5*d^2)) + (3*(b^3*c^2 + 5*a^2*b*d^2 - 6*a*b^2*c*d)
)/(20*d^3)) - a*(b*((b^2*c - a*b*d)/(5*d^2) - (2*b*(a*d - b*c))/(5*d^2)) +
(b^3*c - a*b^2*d)/(5*d^2))))/(15*b^3*g^6*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d

```
 - 3*a^2*b*c*d^2)) - (B^2*d^5*i^2*x^4*(b*(b*((b^2*c - a*b*d)/(5*d^2) - (2*b
*(a*d - b*c))/(5*d^2)) + (b^3*c - a*b^2*d)/(5*d^2)) + (b^4*c - a*b^3*d)/(5*
d^2)))/(15*b^3*g^6*(a^3*d^3 - b^3*c^3 + 3*a*b^2...
```

3.74 $\int (ag+bgx)^3(ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=1089

$$\frac{5B^2(bc-ad)^6g^3i^3x}{84b^3d^3}+\frac{B^2(bc-ad)^3g^3i^3(a+bx)^4}{140b^4}-\frac{29B^2(bc-ad)^5g^3i^3(c+dx)^2}{840b^2d^4}+\frac{47B^2(bc-ad)^4g^3i^3(c+dx)}{1260bd^4}$$

```
[Out] 5/84*B^2*(-a*d+b*c)^6*g^3*i^3*x/b^3/d^3+1/140*B^2*(-a*d+b*c)^3*g^3*i^3*(b*x
+a)^4/b^4-29/840*B^2*(-a*d+b*c)^5*g^3*i^3*(d*x+c)^2/b^2/d^4+47/1260*B^2*(-a
*d+b*c)^4*g^3*i^3*(d*x+c)^3/b/d^4-13/420*B^2*(-a*d+b*c)^3*g^3*i^3*(d*x+c)^4
/d^4+1/105*b*B^2*(-a*d+b*c)^2*g^3*i^3*(d*x+c)^5/d^4-1/210*B^2*(-a*d+b*c)^7*
g^3*i^3*ln((b*x+a)/(d*x+c))/b^4/d^4-1/210*B*(-a*d+b*c)^4*g^3*i^3*(b*x+a)^3*
(A+B*ln(e*(b*x+a)/(d*x+c)))/b^4/d-3/140*B*(-a*d+b*c)^3*g^3*i^3*(b*x+a)^4*(A
+B*ln(e*(b*x+a)/(d*x+c)))/b^4-1/35*B*(-a*d+b*c)^2*g^3*i^3*(b*x+a)^4*(d*x+c)
*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^3+2/21*B*(-a*d+b*c)^4*g^3*i^3*(d*x+c)^3*(A+B
*ln(e*(b*x+a)/(d*x+c)))/b/d^4-3/14*B*(-a*d+b*c)^3*g^3*i^3*(d*x+c)^4*(A+B*ln
(e*(b*x+a)/(d*x+c)))/d^4+6/35*b*B*(-a*d+b*c)^2*g^3*i^3*(d*x+c)^5*(A+B*ln(e*
(b*x+a)/(d*x+c)))/d^4-1/21*b^2*B*(-a*d+b*c)*g^3*i^3*(d*x+c)^6*(A+B*ln(e*(b*
x+a)/(d*x+c)))/d^4+1/140*(-a*d+b*c)^3*g^3*i^3*(b*x+a)^4*(A+B*ln(e*(b*x+a)/(
d*x+c)))^2/b^4+1/35*(-a*d+b*c)^2*g^3*i^3*(b*x+a)^4*(d*x+c)*(A+B*ln(e*(b*x+a
)/(d*x+c)))^2/b^3+1/14*(-a*d+b*c)*g^3*i^3*(b*x+a)^4*(d*x+c)^2*(A+B*ln(e*(b*
x+a)/(d*x+c)))^2/b^2+1/7*g^3*i^3*(b*x+a)^4*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x
+c)))^2/b+1/420*B*(-a*d+b*c)^5*g^3*i^3*(b*x+a)^2*(3*A+B+3*B*ln(e*(b*x+a)/(d
*x+c)))/b^4/d^2-1/420*B*(-a*d+b*c)^6*g^3*i^3*(b*x+a)*(6*A+5*B+6*B*ln(e*(b*x
+a)/(d*x+c)))/b^4/d^3-1/420*B*(-a*d+b*c)^7*g^3*i^3*ln((-a*d+b*c)/b/(d*x+c))
*(6*A+11*B+6*B*ln(e*(b*x+a)/(d*x+c)))/b^4/d^4-11/420*B^2*(-a*d+b*c)^7*g^3*i
^3*ln(d*x+c)/b^4/d^4-1/70*B^2*(-a*d+b*c)^7*g^3*i^3*polylog(2,d*(b*x+a)/b/(d
*x+c))/b^4/d^4
```

Rubi [A]
time = 1.00, antiderivative size = 1089, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 14, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2562, 2383, 2381, 2384, 2354, 2438, 2373, 45, 47, 37, 2382, 12, 79, 1634}

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,
x]
```

```
[Out] (5*B^2*(b*c - a*d)^6*g^3*i^3*x)/(84*b^3*d^3) + (B^2*(b*c - a*d)^3*g^3*i^3*(
a + b*x)^4)/(140*b^4) - (29*B^2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2)/(840*b^2
*d^4) + (47*B^2*(b*c - a*d)^4*g^3*i^3*(c + d*x)^3)/(1260*b*d^4) - (13*B^2*(
```

```
b*c - a*d)^3*g^3*i^3*(c + d*x)^4)/(420*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i^3*
(c + d*x)^5)/(105*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*Log[(a + b*x)/(c + d*x)
])/(210*b^4*d^4) - (B*(b*c - a*d)^4*g^3*i^3*(a + b*x)^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(210*b^4*d) - (3*B*(b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(140*b^4) - (B*(b*c - a*d)^2*g^3*i^3*(a
+ b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(35*b^3) + (2*B*(b
*c - a*d)^4*g^3*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(21*b
*d^4) - (3*B*(b*c - a*d)^3*g^3*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(14*d^4) + (6*b*B*(b*c - a*d)^2*g^3*i^3*(c + d*x)^5*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/(35*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*(c + d*x)^6*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(21*d^4) + ((b*c - a*d)^3*g^3*i^3*(a
+ b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(140*b^4) + ((b*c - a*d)^2
*g^3*i^3*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(35*
b^3) + ((b*c - a*d)*g^3*i^3*(a + b*x)^4*(c + d*x)^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2)/(14*b^2) + (g^3*i^3*(a + b*x)^4*(c + d*x)^3*(A + B*Log[(e*
(a + b*x))/(c + d*x)])^2)/(7*b) + (B*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2*(3*A
 + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(420*b^4*d^2) - (B*(b*c - a*d)^6*
g^3*i^3*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(420*b^4*
d^3) - (B*(b*c - a*d)^7*g^3*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(6*A + 11*B
+ 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(420*b^4*d^4) - (11*B^2*(b*c - a*d)^7*
g^3*i^3*Log[c + d*x])/(420*b^4*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))])/(70*b^4*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*(S
implify[m + n + 2]/((b*c - a*d)*(m + 1))), Int[(a + b*x)^Simplify[m + 1]*(c
```

```
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (74c+74dx)^3(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int \left(\frac{(-bc+ad)^3g^3(74c+74dx)^3\left(A+B\log\right.}{d^3}\right.$$

$$= \frac{(b^3g^3)\int (74c+74dx)^6\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{405224d^3}$$

$$= -\frac{101306(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\right.\right.}{d^4}$$

$$= -\frac{101306(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\right.\right.}{d^4}$$

$$= -\frac{101306(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\right.\right.}{d^4}$$

$$= -\frac{101306(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\right.\right.}{d^4}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{101306B(bc-ad}{}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-a}{}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-a}{}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-a}{35b^3d^3}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-a}{35b^3d^3}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-a}{35b^3d^3}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-a}{35b^3d^3}$$

Mathematica [**B**] Leaf count is larger than twice the leaf count of optimal. 2330 vs. $2(1089) = 2178$.

time = 2.11, size = 2330, normalized size = 2.14

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2,x]
```

```
[Out] (g^3*i^3*(35*(b*c - a*d)^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2 + 84*d*(b*c - a*d)^2*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2
+ 70*d^2*(b*c - a*d)*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 2
0*d^3*(a + b*x)^7*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (35*B*(b*c - a*d
)^4*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*
x))/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/
(c + d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*
(b*c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)])*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2
- 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)
*Log[c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*
d^4) + (7*B*(b*c - a*d)^3*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*
(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*
Log[(e*(a + b*x))/(c + d*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/
(c + d*x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a
*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*
b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3
- 6*(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d
)*Log[c + d*x]) + 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
- Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d
^4 - (7*B*(b*c - a*d)^2*(24*b^2*B*c*d*(b*c - a*d)^3*x + 120*A*b*d*(b*c - a*
d)^4*x + 130*b*B*d*(b*c - a*d)^4*x + 24*a*b*B*d^2*(-(b*c) + a*d)^3*x - 12*b
*B*c*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*a*B*d^3*(b*c - a*d)^2*(a + b*x)^2 +
 35*B*d^2*(-(b*c) + a*d)^3*(a + b*x)^2 + 8*b*B*c*d^3*(b*c - a*d)*(a + b*x)^
3 + 10*B*d^3*(b*c - a*d)^2*(a + b*x)^3 + 8*a*B*d^4*(-(b*c) + a*d)*(a + b*x)
^3 - 6*b*B*c*d^4*(a + b*x)^4 + 6*a*B*d^5*(a + b*x)^4 + 120*B*d*(b*c - a*d)^
4*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x
)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3
*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(
A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*d^5*(a + b*x)^5*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]) - 24*b*B*c*(b*c - a*d)^4*Log[c + d*x] + 24*a*B*d*(b*c -
a*d)^4*Log[c + d*x] - 250*B*(b*c - a*d)^5*Log[c + d*x] - 120*(b*c - a*d)^5*
(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 60*B*(b*c - a*d)^5*((2*
Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[
```

```
2, (b*(c + d*x))/(b*c - a*d)])))/(6*d^4) + (B*(b*c - a*d)*(60*b^2*B*c*d*(b*
c - a*d)^4*x - 60*a*b*B*d^2*(b*c - a*d)^4*x + 360*A*b*d*(b*c - a*d)^5*x + 4
62*b*B*d*(b*c - a*d)^5*x - 30*b*B*c*d^2*(b*c - a*d)^3*(a + b*x)^2 + 30*a*B*
d^3*(b*c - a*d)^3*(a + b*x)^2 - 141*B*d^2*(b*c - a*d)^4*(a + b*x)^2 + 20*b*
B*c*d^3*(b*c - a*d)^2*(a + b*x)^3 - 20*a*B*d^4*(b*c - a*d)^2*(a + b*x)^3 +
54*B*d^3*(b*c - a*d)^3*(a + b*x)^3 - 15*b*B*c*d^4*(b*c - a*d)*(a + b*x)^4 +
 15*a*B*d^5*(b*c - a*d)*(a + b*x)^4 - 18*B*d^4*(b*c - a*d)^2*(a + b*x)^4 +
12*b*B*c*d^5*(a + b*x)^5 - 12*a*B*d^6*(a + b*x)^5 + 360*B*d*(b*c - a*d)^5*(
a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 180*d^2*(b*c - a*d)^4*(a + b*x)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)]) + 120*d^3*(b*c - a*d)^3*(a + b*x)^3*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]) - 90*d^4*(b*c - a*d)^2*(a + b*x)^4*(A + B
*Log[(e*(a + b*x))/(c + d*x)]) + 72*d^5*(b*c - a*d)*(a + b*x)^5*(A + B*Log[
(e*(a + b*x))/(c + d*x)]) - 60*d^6*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]) - 60*b*B*c*(b*c - a*d)^5*Log[c + d*x] + 60*a*B*d*(b*c - a*d)^5*Log
[c + d*x] - 822*B*(b*c - a*d)^6*Log[c + d*x] - 360*(b*c - a*d)^6*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 180*B*(b*c - a*d)^6*((2*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])))/(9*d^4)))/(140*b^4)
```

Maple [F]
time = 0.43, size = 0, normalized size = 0.00

$$\int (bgx+ag)^3\,(dix+ci)^3\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5522 vs. 2(987) = 1974.
time = 0.51, size = 5522, normalized size = 5.07

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="maxima")
```

```
[Out] -1/7*I*A^2*b^3*d^3*g^3*x^7 - 1/2*I*A^2*b^3*c*d^2*g^3*x^6 - 1/2*I*A^2*a*b^2*
d^3*g^3*x^6 - 3/5*I*A^2*b^3*c^2*d*g^3*x^5 - 9/5*I*A^2*a*b^2*c*d^2*g^3*x^5 -
 3/5*I*A^2*a^2*b*d^3*g^3*x^5 - 1/4*I*A^2*b^3*c^3*g^3*x^4 - 9/4*I*A^2*a*b^2*
c^2*d*g^3*x^4 - 9/4*I*A^2*a^2*b*c*d^2*g^3*x^4 - 1/4*I*A^2*a^3*d^3*g^3*x^4 -
 I*A^2*a*b^2*c^3*g^3*x^3 - 3*I*A^2*a^2*b*c^2*d*g^3*x^3 - I*A^2*a^3*c*d^2*g^
3*x^3 - 3/2*I*A^2*a^2*b*c^3*g^3*x^2 - 3/2*I*A^2*a^3*c^2*d*g^3*x^2 - 2*I*(x*
```

log(b*x*e/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)
*A*B*a^3*c^3*g^3 - 3*I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(
b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*b*c^3*g^
3 - I*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3
- 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)
*x)/(b^2*d^2))*A*B*a*b^2*c^3*g^3 - 1/12*I*(6*x^4*log(b*x*e/(d*x + c) + a*e/
(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^
2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*
x)/(b^3*d^3))*A*B*b^3*c^3*g^3 - 3*I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c
)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B
*a^3*c^2*d*g^3 - 3*I*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*lo
g(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2
*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b*c^2*d*g^3 - 3/4*I*(6*x^4*log(b*x*e/
(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^
4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3
*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^2*c^2*d*g^3 - 1/10*I*(12*x^5*log(b*x*
e/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c
)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3
+ 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*
b^3*c^2*d*g^3 - I*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^3*c*d^2*g^3 - 3/4*I*(6*x^4*log(b*x*e/(d*x
+ c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (
2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3
- a^3*d^3)*x)/(b^3*d^3))*A*B*a^2*b*c*d^2*g^3 - 3/10*I*(12*x^5*log(b*x*e/(d*
x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5
 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(
b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*a*b^2
*c*d^2*g^3 - 1/60*I*(60*x^6*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 60*a^6*l
og(b*x + a)/b^6 + 60*c^6*log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5
 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3
- 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*A*B
*b^3*c*d^2*g^3 - 1/12*I*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4
*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3
 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*
a^3*d^3*g^3 - 1/10*I*(12*x^5*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 12*a^5*
log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4
 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(
b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*a^2*b*d^3*g^3 - 1/60*I*(60*x^6*log(b*x
*e/(d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6*log(d*x +
c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x
^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 +
60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*A*B*a*b^2*d^3*g^3 - 1/210*I*(60*x^7*lo
g(b*x*e/(d*x + c) + a*e/(d*x + c)) + 60*a^7*log(b*x + a)/b^7 - 60*c^7*log(d
x + c)/d^7 - (10(b^6*c*d^5 - a*b^5*d^6)*x^6 - 12*(b^6*c^2*d^4 - a^2*b^4*d

```
^6)*x^5 + 15*(b^6*c^3*d^3 - a^3*b^3*d^6)*x^4 - 20*(b^6*c^4*d^2 - a^4*b^2*d^
6)*x^3 + 30*(b^6*c^5*d - a^5*b*d^6)*x^2 - 60*(b^6*c^6 - a^6*d^6)*x)/(b^6*d^
6))*A*B*b^3*d^3*g^3 - I*A^2*a^3*c^3*g^3*x + 1/420*(-6*I*b^6*c^7*g^3 + 36*I*
a*b^5*c^6*d*g^3 - 87*I*a^2*b^4*c^5*d^2*g^3 + 103*I*a^3*b^3*c^4*d^3*g^3 + 10
7*I*a^4*b^2*c^3*d^4*g^3 - 39*I*a^5*b*c^2*d^5*g^3 + 6*I*a^6*c*d^6*g^3)*B^2*l
og(d*x + c)/(b^3*d^4) + 1/70*(-I*b^7*c^7*g^3 + 7*I*a*b^6*c^6*d*g^3 - 21*I*a
^2*b^5*c^5*d^2*g^3 + 35*I*a^3*b^4*c^4*d^3*g^3 - 35*I*a^4*b^3*c^3*d^4*g^3 +
21*I*a^5*b^2*c^2*d^5*g^3 - 7*I*a^6*b*c*d^6*g^3 + I*a^7*d^7*g^3)*(log(b*x +
a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*
B^2/(b^4*d^4) - 1/2520*(360*I*B^2*b^7*d^7*g^3*x^7 - 60*(-19*I*b^7*c*d^6*g^3
 - 23*I*a*b^6*d^7*g^3)*B^2*x^6 - 24*(-49*I*b^7*c^2*d^5*g^3 - 187*I*a*b^6*c*
d^6*g^3 - 79*I*a^2*b^5*d^7*g^3)*B^2*x^5 - 12*(-32*I*b^7*c^3*d^4*g^3 - 394*I
*a*b^6*c^2*d^5*g^3 - 541*I*a^2*b^5*c*d^6*g^3 - 83*I*a^3*b^4*d^7*g^3)*B^2*x^
4 - 2*(-5*I*b^7*c^4*d^3*g^3 - 748*I*a*b^6*c^3*d^4*g^3 - 3606*I*a^2*b^5*c^2*
d^5*g^3 - 1924*I*a^3*b^4*c*d^6*g^3 - 17*I*a^4*b^3*d^7*g^3)*B^2*x^3 - 3*(3*I
*b^7*c^5*d^2*g^3 - 25*I*a*b^6*c^4*d^3*g^3 - 698...
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="fricas")
```

```
[Out] 1/140*(-20*I*B^2*b^3*d^3*g^3*x^7 - 140*I*B^2*a^3*c^3*g^3*x - 70*(I*B^2*b^3*
c*d^2 + I*B^2*a*b^2*d^3)*g^3*x^6 - 84*(I*B^2*b^3*c^2*d + 3*I*B^2*a*b^2*c*d^
2 + I*B^2*a^2*b*d^3)*g^3*x^5 - 35*(I*B^2*b^3*c^3 + 9*I*B^2*a*b^2*c^2*d + 9*
I*B^2*a^2*b*c*d^2 + I*B^2*a^3*d^3)*g^3*x^4 - 140*(I*B^2*a*b^2*c^3 + 3*I*B^2
*a^2*b*c^2*d + I*B^2*a^3*c*d^2)*g^3*x^3 - 210*(I*B^2*a^2*b*c^3 + I*B^2*a^3*
c^2*d)*g^3*x^2)*log((b*x + a)*e/(d*x + c))^2 + integral(1/70*(-70*I*A^2*b^4
*d^4*g^3*x^8 - 70*I*A^2*a^4*c^4*g^3 - 280*(I*A^2*b^4*c*d^3 + I*A^2*a*b^3*d^
4)*g^3*x^7 - 140*(3*I*A^2*b^4*c^2*d^2 + 8*I*A^2*a*b^3*c*d^3 + 3*I*A^2*a^2*b
^2*d^4)*g^3*x^6 - 280*(I*A^2*b^4*c^3*d + 6*I*A^2*a*b^3*c^2*d^2 + 6*I*A^2*a^
2*b^2*c*d^3 + I*A^2*a^3*b*d^4)*g^3*x^5 - 70*(I*A^2*b^4*c^4 + 16*I*A^2*a*b^3
*c^3*d + 36*I*A^2*a^2*b^2*c^2*d^2 + 16*I*A^2*a^3*b*c*d^3 + I*A^2*a^4*d^4)*g
^3*x^4 - 280*(I*A^2*a*b^3*c^4 + 6*I*A^2*a^2*b^2*c^3*d + 6*I*A^2*a^3*b*c^2*d
^2 + I*A^2*a^4*c*d^3)*g^3*x^3 - 140*(3*I*A^2*a^2*b^2*c^4 + 8*I*A^2*a^3*b*c^
3*d + 3*I*A^2*a^4*c^2*d^2)*g^3*x^2 - 280*(I*A^2*a^3*b*c^4 + I*A^2*a^4*c^3*d
)*g^3*x + (-140*I*A*B*b^4*d^4*g^3*x^8 - 140*I*A*B*a^4*c^4*g^3 - 20*((28*I*A
*B - I*B^2)*b^4*c*d^3 + (28*I*A*B + I*B^2)*a*b^3*d^4)*g^3*x^7 - 70*(32*I*A*
B*a*b^3*c*d^3 + (12*I*A*B - I*B^2)*b^4*c^2*d^2 + (12*I*A*B + I*B^2)*a^2*b^2
*d^4)*g^3*x^6 - 28*((20*I*A*B - 3*I*B^2)*b^4*c^3*d + 6*(20*I*A*B - I*B^2)*a
*b^3*c^2*d^2 + 6*(20*I*A*B + I*B^2)*a^2*b^2*c*d^3 + (20*I*A*B + 3*I*B^2)*a^
```

```
3*b*d^4)*g^3*x^5 - 35*(144*I*A*B*a^2*b^2*c^2*d^2 + (4*I*A*B - I*B^2)*b^4*c^
4 + 8*(8*I*A*B - I*B^2)*a*b^3*c^3*d + 8*(8*I*A*B + I*B^2)*a^3*b*c*d^3 + (4*
I*A*B + I*B^2)*a^4*d^4)*g^3*x^4 - 140*((4*I*A*B - I*B^2)*a*b^3*c^4 + 2*(12*
I*A*B - I*B^2)*a^2*b^2*c^3*d + 2*(12*I*A*B + I*B^2)*a^3*b*c^2*d^2 + (4*I*A*
B + I*B^2)*a^4*c*d^3)*g^3*x^3 - 70*(32*I*A*B*a^3*b*c^3*d + 3*(4*I*A*B - I*B
^2)*a^2*b^2*c^4 + 3*(4*I*A*B + I*B^2)*a^4*c^2*d^2)*g^3*x^2 - 140*((4*I*A*B
- I*B^2)*a^3*b*c^4 + (4*I*A*B + I*B^2)*a^4*c^3*d)*g^3*x)*log((b*x + a)*e/(d
*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(I*d*x + I*c)^3*(B*log((b*x + a)*e/(d*x + c)) + A
)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)^3\,(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2,
x)
```

```
[Out] int((a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2,
 x)
```

3.75 $\int (ag+bgx)^2(ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=908

$$-\frac{7B^2(bc-ad)^5g^2i^3x}{180b^3d^2}-\frac{7B^2(bc-ad)^4g^2i^3(c+dx)^2}{360b^2d^3}-\frac{B^2(bc-ad)^3g^2i^3(c+dx)^3}{60bd^3}+\frac{B^2(bc-ad)^2g^2i^3(c+dx)^4}{60d^3}$$

[Out] -7/180*B^2*(-a*d+b*c)^5*g^2*i^3*x/b^3/d^2-7/360*B^2*(-a*d+b*c)^4*g^2*i^3*(d*x+c)^2/b^2/d^3-1/60*B^2*(-a*d+b*c)^3*g^2*i^3*(d*x+c)^3/b/d^3+1/60*B^2*(-a*d+b*c)^2*g^2*i^3*(d*x+c)^4/d^3+1/36*B^2*(-a*d+b*c)^6*g^2*i^3*ln((b*x+a)/(d*x+c))/b^4/d^3-1/60*B*(-a*d+b*c)^4*g^2*i^3*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^4/d-1/30*B*(-a*d+b*c)^3*g^2*i^3*(b*x+a)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^4-1/10*B*(-a*d+b*c)^4*g^2*i^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2/d^3+1/45*B*(-a*d+b*c)^3*g^2*i^3*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/d^3+7/60*B*(-a*d+b*c)^2*g^2*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3-1/15*b*B*(-a*d+b*c)*g^2*i^3*(d*x+c)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3+1/60*(-a*d+b*c)^3*g^2*i^3*(b*x+a)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^4+1/20*(-a*d+b*c)^2*g^2*i^3*(b*x+a)^3*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^3+1/10*(-a*d+b*c)*g^2*i^3*(b*x+a)^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^2+1/6*g^2*i^3*(b*x+a)^3*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b+1/60*B*(-a*d+b*c)^5*g^2*i^3*(b*x+a)*(2*A+B+2*B*ln(e*(b*x+a)/(d*x+c)))/b^4/d^2+1/60*B*(-a*d+b*c)^6*g^2*i^3*ln((-a*d+b*c)/b/(d*x+c))*(2*A+3*B+2*B*ln(e*(b*x+a)/(d*x+c)))/b^4/d^3+11/180*B^2*(-a*d+b*c)^6*g^2*i^3*ln(d*x+c)/b^4/d^3+1/30*B^2*(-a*d+b*c)^6*g^2*i^3*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/d^3

Rubi [A]
time = 0.85, antiderivative size = 908, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$, Rules used = {2562, 2383, 2381, 2384, 2354, 2438, 2373, 45, 2382, 12, 907}

Antiderivative was successfully verified.

[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]

[Out] (-7*B^2*(b*c - a*d)^5*g^2*i^3*x)/(180*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2)/(360*b^2*d^3) - (B^2*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4)/(60*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*Log[(a + b*x)/(c + d*x)])/(36*b^4*d^3) - (B*(b*c - a*d)^4*g^2*i^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^4*d) - (B*(b*c - a*d)^3*g^2*i^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^4) - (B*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]

```
))/(10*b^2*d^3) + (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(45*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(60*d^3) - (b*B*(b*c - a*d)*g^2*i^3*(c + d
*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*d^3) + ((b*c - a*d)^3*g^2*i
^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(60*b^4) + ((b*c - a
*d)^2*g^2*i^3*(a + b*x)^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)
/(20*b^3) + ((b*c - a*d)*g^2*i^3*(a + b*x)^3*(c + d*x)^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(10*b^2) + (g^2*i^3*(a + b*x)^3*(c + d*x)^3*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)])^2)/(6*b) + (B*(b*c - a*d)^5*g^2*i^3*(a + b*x)*(
2*A + B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^4*d^2) + (B*(b*c - a*d)^
6*g^2*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B + 2*B*Log[(e*(a + b*x))
/(c + d*x)]))/(60*b^4*d^3) + (11*B^2*(b*c - a*d)^6*g^2*i^3*Log[c + d*x])/(1
80*b^4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*PolyLog[2, (d*(a + b*x))/(b*(c + d
*x))])/(30*b^4*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
```

b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ[m + r*(q + 1) + 1, 0] && NeQ[m, -1]

Rule 2381

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]

Rule 2382

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]

Rule 2383

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /; FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1] && GtQ[m, 0]

Rule 2384

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n])/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && GtQ[m, 0]

Rule 2438

Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]

Rule 2562

Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy

```
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (75c+75dx)^3(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx = \int\left(\frac{(-bc+ad)^2g^2(75c+75dx)^3\left(A+B\log\right.}{d^2}\right.$$

$$= \frac{(b^2g^2)\int(75c+75dx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5625d^2}$$

$$= \frac{421875(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{4d^3}$$

$$= \frac{421875(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{4d^3}$$

$$= \frac{421875(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{4d^3}$$

$$= \frac{421875(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{4d^3}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{28125B(bc-ad)}{}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{28125B^2(bc-ac}{}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{28125B^2(bc-ac}{}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{9375B^2(bc-ad)}{b^3d^2}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{9375B^2(bc-ad)}{b^3d^2}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{9375B^2(bc-ad)}{b^3d^2}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{9375B^2(bc-ad)}{b^3d^2}$$

Mathematica [A]
time = 0.89, size = 1555, normalized size = 1.71

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2,x]
```

```
[Out] (g^2*i^3*(15*(b*c - a*d)^2*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2 - 24*b*(b*c - a*d)*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
10*b^2*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (5*B*(b*c - a*d
)^3*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[a
 + b*x]) - B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c -
a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c +
 d*x)] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
 + 2*b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^3
*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[
c + d*x] - 3*B*(b*c - a*d)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^4 + (2*
B*(b*c - a*d)^2*(24*A*b*d*(b*c - a*d)^3*x - 12*B*(b*c - a*d)^3*(b*d*x + (b*
c - a*d)*Log[a + b*x]) - 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x + b^2*(c +
d*x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) - B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2
*x + 3*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Lo
g[a + b*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] +
 12*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 8*
b^3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*b^4*(c
 + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*(b*c - a*d)^4*Log[a + b
*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x]
- 12*B*(b*c - a*d)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
 - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^4 - (B*(b*c - a
*d)*(120*A*b*d*(b*c - a*d)^4*x - 60*B*(b*c - a*d)^4*(b*d*x + (b*c - a*d)*Lo
g[a + b*x]) - 20*B*(b*c - a*d)^3*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2
*(b*c - a*d)^2*Log[a + b*x]) - 5*B*(b*c - a*d)^2*(6*b*d*(b*c - a*d)^2*x + 3
*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a +
b*x]) - 2*B*(b*c - a*d)*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c +
d*x)^2 + 4*b^3*(b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)
^4*Log[a + b*x]) + 120*B*d*(b*c - a*d)^4*(a + b*x)*Log[(e*(a + b*x))/(c + d
*x)] + 60*b^2*(b*c - a*d)^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
) + 40*b^3*(b*c - a*d)^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) +
 30*b^4*(b*c - a*d)*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*b
^5*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 120*(b*c - a*d)^5*Log
[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 120*B*(b*c - a*d)^5*Log[c
+ d*x] - 60*B*(b*c - a*d)^5*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x
))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(6*b^4)))/
(60*d^3)
```

Maple [F]

time = 0.53, size = 0, normalized size = 0.00

$$\int (bgx+ag)^2 (dix+ci)^3 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 4053 vs. 2(824) = 1648.
time = 0.48, size = 4053, normalized size = 4.46

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="maxima")
```

```
[Out] -1/6*I*A^2*b^2*d^3*g^2*x^6 - 3/5*I*A^2*b^2*c*d^2*g^2*x^5 - 2/5*I*A^2*a*b*d^
3*g^2*x^5 - 3/4*I*A^2*b^2*c^2*d*g^2*x^4 - 3/2*I*A^2*a*b*c*d^2*g^2*x^4 - 1/4
*I*A^2*a^2*d^3*g^2*x^4 - 1/3*I*A^2*b^2*c^3*g^2*x^3 - 2*I*A^2*a*b*c^2*d*g^2*
x^3 - I*A^2*a^2*c*d^2*g^2*x^3 - I*A^2*a*b*c^3*g^2*x^2 - 3/2*I*A^2*a^2*c^2*d
*g^2*x^2 - 2*I*(x*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b -
 c*log(d*x + c)/d)*A*B*a^2*c^3*g^2 - 2*I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*
x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d)
)*A*B*a*b*c^3*g^2 - 1/3*I*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a
^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2
*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*c^3*g^2 - 3*I*(x^2*log(b*x*e/(d*
x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*
c - a*d)*x/(b*d))*A*B*a^2*c^2*d*g^2 - 2*I*(2*x^3*log(b*x*e/(d*x + c) + a*e/
(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d -
a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b*c^2*d*g^2 - 1/4*
I*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*
c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*
b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^2*c^2*d*g^2 - I*(2*x
^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*lo
g(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d
^2))*A*B*a^2*c*d^2*g^2 - 1/2*I*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c))
 - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d
^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3
))*A*B*a*b*c*d^2*g^2 - 1/10*I*(12*x^5*log(b*x*e/(d*x + c) + a*e/(d*x + c))
 + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3
*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x
```

```
^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^2*c*d^2*g^2 - 1/12*I*(6*x^4
*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(
d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x
^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a^2*d^3*g^2 - 1/15*I*(12*x^5*l
og(b*x*e/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(
d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^
4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4
))*A*B*a*b*d^3*g^2 - 1/180*I*(60*x^6*log(b*x*e/(d*x + c) + a*e/(d*x + c)) -
 60*a^6*log(b*x + a)/b^6 + 60*c^6*log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4
*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*
d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*
d^5))*A*B*b^2*d^3*g^2 - I*A^2*a^2*c^3*g^2*x + 1/180*(4*I*b^5*c^6*g^2 - 18*I
*a*b^4*c^5*d*g^2 + 27*I*a^2*b^3*c^4*d^2*g^2 + 74*I*a^3*b^2*c^3*d^3*g^2 - 33
*I*a^4*b*c^2*d^4*g^2 + 6*I*a^5*c*d^5*g^2)*B^2*log(d*x + c)/(b^3*d^3) + 1/30
*(I*b^6*c^6*g^2 - 6*I*a*b^5*c^5*d*g^2 + 15*I*a^2*b^4*c^4*d^2*g^2 - 20*I*a^3
*b^3*c^3*d^3*g^2 + 15*I*a^4*b^2*c^2*d^4*g^2 - 6*I*a^5*b*c*d^5*g^2 + I*a^6*d
^6*g^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
a*d)/(b*c - a*d)))*B^2/(b^4*d^3) - 1/360*(60*I*B^2*b^6*d^6*g^2*x^6 - 24*(-8
*I*b^6*c*d^5*g^2 - 7*I*a*b^5*d^6*g^2)*B^2*x^5 - 6*(-33*I*b^6*c^2*d^4*g^2 -
94*I*a*b^5*c*d^5*g^2 - 23*I*a^2*b^4*d^6*g^2)*B^2*x^4 - 2*(-31*I*b^6*c^3*d^3
*g^2 - 303*I*a*b^5*c^2*d^4*g^2 - 261*I*a^2*b^4*c*d^5*g^2 - 5*I*a^3*b^3*d^6*
g^2)*B^2*x^3 + (5*I*b^6*c^4*d^2*g^2 + 166*I*a*b^5*c^3*d^3*g^2 + 660*I*a^2*b
^4*c^2*d^4*g^2 + 82*I*a^3*b^3*c*d^5*g^2 - 13*I*a^4*b^2*d^6*g^2)*B^2*x^2 - 2
*(2*I*b^6*c^5*d*g^2 - 15*I*a*b^5*c^4*d^2*g^2 - 53*I*a^2*b^4*c^3*d^3*g^2 - 1
67*I*a^3*b^3*c^2*d^4*g^2 + 63*I*a^4*b^2*c*d^5*g^2 - 10*I*a^5*b*d^6*g^2)*B^2
*x - 6*(-10*I*B^2*b^6*d^6*g^2*x^6 - 60*I*B^2*a^2*b^4*c^3*d^3*g^2*x + 12*(-3
*I*b^6*c*d^5*g^2 - 2*I*a*b^5*d^6*g^2)*B^2*x^5 + 15*(-3*I*b^6*c^2*d^4*g^2 -
6*I*a*b^5*c*d^5*g^2 - I*a^2*b^4*d^6*g^2)*B^2*x^4 + 20*(-I*b^6*c^3*d^3*g^2 -
 6*I*a*b^5*c^2*d^4*g^2 - 3*I*a^2*b^4*c*d^5*g^2)*B^2*x^3 + 30*(-2*I*a*b^5*c^
3*d^3*g^2 - 3*I*a^2*b^4*c^2*d^4*g^2)*B^2*x^2 + (-20*I*a^3*b^3*c^3*d^3*g^2 +
 15*I*a^4*b^2*c^2*d^4*g^2 - 6*I*a^5*b*c*d^5*g^2 + I*a^6*d^6*g^2)*B^2)*log(b
*x + a)^2 - 6*(-10*I*B^2*b^6*d^6*g^2*x^6 - 60*I*B^2*a^2*b^4*c^3*d^3*g^2*x +
 12*(-3*I*b^6*c*d^5*g^2 - 2*I*a*b^5*d^6*g^2)*B^2*x^5 + 15*(-3*I*b^6*c^2*d^4
*g^2 - 6*I*a*b^5*c*d^5*g^2 - I*a^2*b^4*d^6*g^2)*B^2*x^4 + 20*(-I*b^6*c^3*d^
3*g^2 - 6*I*a*b^5*c^2*d^4*g^2 - 3*I*a^2*b^4*c*d^5*g^2)*B^2*x^3 + 30*(-2*I*a
*b^5*c^3*d^3*g^2 - 3*I*a^2*b^4*c^2*d^4*g^2)*B^2*x^2 + (-I*b^6*c^6*g^2 + 6*I
*a*b^5*c^5*d*g^2 - 15*I*a^2*b^4*c^4*d^2*g^2)*B^2)*log(d*x + c)^2 - 2*(-60*I
*B^2*b^6*d^6*g^2*x^6 + 12*(-17*I*b^6*c*d^5*g^2 - 13*I*a*b^5*d^6*g^2)*B^2*x^
5 + 3*(-77*I*b^6*c^2*d^4*g^2 - 186*I*a*b^5*c*d^5*g^2 - 37*I*a^2*b^4*d^6*g^2
)*B^2*x^4 + 2*(-41*I*b^6*c^3*d^3*g^2 - 339*I*a*b^5*c^2*d^4*g^2 - 219*I*a^2*
b^4*c*d^5*g^2 - I*a^3*b^3*d^6*g^2)*B^2*x^3 + 3*(I*b^6*c^4*d^2*g^2 - 86*I*a*
b^5*c^3*d^3*g^2 - 210*I*a^2*b^4*c^2*d^4*g^2 - 6...
```

Fricas [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="fricas")
```

```
[Out] 1/60*(-10*I*B^2*b^2*d^3*g^2*x^6 - 60*I*B^2*a^2*c^3*g^2*x - 12*(3*I*B^2*b^2*
c*d^2 + 2*I*B^2*a*b*d^3)*g^2*x^5 - 15*(3*I*B^2*b^2*c^2*d + 6*I*B^2*a*b*c*d^
2 + I*B^2*a^2*d^3)*g^2*x^4 - 20*(I*B^2*b^2*c^3 + 6*I*B^2*a*b*c^2*d + 3*I*B^
2*a^2*c*d^2)*g^2*x^3 - 30*(2*I*B^2*a*b*c^3 + 3*I*B^2*a^2*c^2*d)*g^2*x^2)*lo
g((b*x + a)*e/(d*x + c))^2 + integral(1/30*(-30*I*A^2*b^3*d^4*g^2*x^7 - 30*
I*A^2*a^3*c^4*g^2 - 30*(4*I*A^2*b^3*c*d^3 + 3*I*A^2*a*b^2*d^4)*g^2*x^6 - 90
*(2*I*A^2*b^3*c^2*d^2 + 4*I*A^2*a*b^2*c*d^3 + I*A^2*a^2*b*d^4)*g^2*x^5 - 30
*(4*I*A^2*b^3*c^3*d + 18*I*A^2*a*b^2*c^2*d^2 + 12*I*A^2*a^2*b*c*d^3 + I*A^2
*a^3*d^4)*g^2*x^4 - 30*(I*A^2*b^3*c^4 + 12*I*A^2*a*b^2*c^3*d + 18*I*A^2*a^2
*b*c^2*d^2 + 4*I*A^2*a^3*c*d^3)*g^2*x^3 - 90*(I*A^2*a*b^2*c^4 + 4*I*A^2*a^2
*b*c^3*d + 2*I*A^2*a^3*c^2*d^2)*g^2*x^2 - 30*(3*I*A^2*a^2*b*c^4 + 4*I*A^2*a
^3*c^3*d)*g^2*x + (-60*I*A*B*b^3*d^4*g^2*x^7 - 60*I*A*B*a^3*c^4*g^2 - 10*((
24*I*A*B - I*B^2)*b^3*c*d^3 + (18*I*A*B + I*B^2)*a*b^2*d^4)*g^2*x^6 - 12*(3
*(10*I*A*B - I*B^2)*b^3*c^2*d^2 + (60*I*A*B + I*B^2)*a*b^2*c*d^3 + (15*I*A*
B + 2*I*B^2)*a^2*b*d^4)*g^2*x^5 - 15*((16*I*A*B - 3*I*B^2)*b^3*c^3*d + 3*(2
4*I*A*B - I*B^2)*a*b^2*c^2*d^2 + (48*I*A*B + 5*I*B^2)*a^2*b*c*d^3 + (4*I*A*
B + I*B^2)*a^3*d^4)*g^2*x^4 - 20*((3*I*A*B - I*B^2)*b^3*c^4 + (36*I*A*B - 5
*I*B^2)*a*b^2*c^3*d + 3*(18*I*A*B + I*B^2)*a^2*b*c^2*d^2 + 3*(4*I*A*B + I*B
^2)*a^3*c*d^3)*g^2*x^3 - 30*(2*(3*I*A*B - I*B^2)*a*b^2*c^4 + (24*I*A*B - I*
B^2)*a^2*b*c^3*d + 3*(4*I*A*B + I*B^2)*a^3*c^2*d^2)*g^2*x^2 - 60*((3*I*A*B
- I*B^2)*a^2*b*c^4 + (4*I*A*B + I*B^2)*a^3*c^3*d)*g^2*x)*log((b*x + a)*e/(d
*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(I*d*x + I*c)^3*(B*log((b*x + a)*e/(d*x + c)) + A
)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)^2\,(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2,
x)
```

```
[Out] int((a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2,
 x)
```

3.76 $\int (ag+bgx)(ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=730

$$\frac{B^2(bc-ad)^4gi^3x}{60b^3d}+\frac{B^2(bc-ad)^3gi^3(c+dx)^2}{30b^2d^2}+\frac{B^2(bc-ad)^2gi^3(c+dx)^3}{30bd^2}-\frac{B^2(bc-ad)^5gi^3\log\left(\frac{a+bx}{c+dx}\right)}{12b^4d^2}-\frac{B(bc}{}$$

```
[Out] 1/60*B^2*(-a*d+b*c)^4*g*i^3*x/b^3/d+1/30*B^2*(-a*d+b*c)^3*g*i^3*(d*x+c)^2/b
^2/d^2+1/30*B^2*(-a*d+b*c)^2*g*i^3*(d*x+c)^3/b/d^2-1/12*B^2*(-a*d+b*c)^5*g*
i^3*ln((b*x+a)/(d*x+c))/b^4/d^2-1/10*B*(-a*d+b*c)^4*g*i^3*(b*x+a)*(A+B*ln(e
*(b*x+a)/(d*x+c)))/b^4/d-1/10*B*(-a*d+b*c)^3*g*i^3*(b*x+a)^2*(A+B*ln(e*(b*x
+a)/(d*x+c)))/b^4+3/20*B*(-a*d+b*c)^3*g*i^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*
x+c)))/b^2/d^2+1/30*B*(-a*d+b*c)^2*g*i^3*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c
)))/b/d^2-1/10*B*(-a*d+b*c)*g*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^2
+1/20*(-a*d+b*c)^3*g*i^3*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^4+1/10*(
-a*d+b*c)^2*g*i^3*(b*x+a)^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^3+3/20*
(-a*d+b*c)*g*i^3*(b*x+a)^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^2+1/5*
g*i^3*(b*x+a)^2*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b-1/10*B*(-a*d+b*c)
^5*g*i^3*ln((-a*d+b*c)/b/(d*x+c))*(A+B+B*ln(e*(b*x+a)/(d*x+c)))/b^4/d^2-11/
60*B^2*(-a*d+b*c)^5*g*i^3*ln(d*x+c)/b^4/d^2-1/10*B^2*(-a*d+b*c)^5*g*i^3*pol
ylog(2,d*(b*x+a)/b/(d*x+c))/b^4/d^2
```

Rubi [A]
time = 0.56, antiderivative size = 730, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$, Rules used = {2562, 2383, 2381, 2384, 2354, 2438, 2373, 45, 2382, 12, 78}

[illegible]

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (B^2*(b*c - a*d)^4*g*i^3*x)/(60*b^3*d) + (B^2*(b*c - a*d)^3*g*i^3*(c + d*x)
^2)/(30*b^2*d^2) + (B^2*(b*c - a*d)^2*g*i^3*(c + d*x)^3)/(30*b*d^2) - (B^2*
(b*c - a*d)^5*g*i^3*Log[(a + b*x)/(c + d*x)])/(12*b^4*d^2) - (B*(b*c - a*d)
^4*g*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^4*d) - (B*(b
*c - a*d)^3*g*i^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^4
) + (3*B*(b*c - a*d)^3*g*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(20*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(30*b*d^2) - (B*(b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(10*d^2) + ((b*c - a*d)^3*g*i^3*(a + b*x)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)])^2)/(20*b^4) + ((b*c - a*d)^2*g*i^3*(a + b*x
)^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(10*b^3) + (3*(b*c -
```

```
a*d)*g*i^3*(a + b*x)^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(20*b^2) + (g*i^3*(a + b*x)^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2)/(5*b) - (B*(b*c - a*d)^5*g*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^4*d^2) - (11*B^2*(b*c - a*d)^5*g*
i^3*Log[c + d*x])/(60*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*PolyLog[2, (d*(a
+ b*x))/(b*(c + d*x))])/(10*b^4*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
```

```
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int (76c+76dx)^3(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int \left(\frac{(-bc+ad)g(76c+76dx)^3\left(A+B\log\left(\right.\right.}{d}\right.$$

$$= \frac{(bg)\int(76c+76dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{76d}$$

$$= -\frac{109744(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a}{c}\right.\right.}{d^2}$$

$$= -\frac{109744(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a}{c}\right.\right.}{d^2}$$

$$= -\frac{109744(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a}{c}\right.\right.}{d^2}$$

$$= -\frac{109744(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a}{c}\right.\right.}{d^2}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B(bc-ad}{}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{219488B^2(bc-ac}{}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{219488B^2(bc-ac}{}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B^2(bc-ac}{15b^3d}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B^2(bc-ac}{15b^3d}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B^2(bc-ac}{15b^3d}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B^2(bc-ac}{15b^3d}$$

Mathematica [A]
time = 0.47, size = 901, normalized size = 1.23

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2,x]
```

```
[Out] (g*i^3*(-5*(b*c - a*d)*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
 4*b*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (5*B*(b*c - a*d)^
2*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[a +
 b*x]) - B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*
d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d
*x)] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) +
 2*b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^3*L
og[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[c
+ d*x] - 3*B*(b*c - a*d)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x)
)/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(3*b^4) - (
B*(b*c - a*d)*(24*A*b*d*(b*c - a*d)^3*x - 12*B*(b*c - a*d)^3*(b*d*x + (b*c
- a*d)*Log[a + b*x]) - 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x + b^2*(c + d*
x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) - B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x
 + 3*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[
a + b*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 1
2*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 8*b^
3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*b^4*(c +
 d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*(b*c - a*d)^4*Log[a + b*x
]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x] -
12*B*(b*c - a*d)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(3*b^4)))/(20*d^2)
```

Maple [**F**]
time = 0.34, size = 0, normalized size = 0.00

$$\int (bgx + ag)\,(dix + ci)^3 \left(A + B\ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2508 vs. 2(659) = 1318.
time = 0.46, size = 2508, normalized size = 3.44

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="maxima")
```

[Out] -1/5*I*A^2*b*d^3*g*x^5 - 3/4*I*A^2*b*c*d^2*g*x^4 - 1/4*I*A^2*a*d^3*g*x^4 -
I*A^2*b*c^2*d*g*x^3 - I*A^2*a*c*d^2*g*x^3 - 1/2*I*A^2*b*c^3*g*x^2 - 3/2*I*A
^2*a*c^2*d*g*x^2 - 2*I*(x*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + a*log(b*x
+ a)/b - c*log(d*x + c)/d)*A*B*a*c^3*g - I*(x^2*log(b*x*e/(d*x + c) + a*e/(
d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*
d))*A*B*b*c^3*g - 3*I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b
*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a*c^2*d*g - I
*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c
^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(
b^2*d^2))*A*B*b*c^2*d*g - I*(2*x^3*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 2
*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 -
 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*c*d^2*g - 1/4*I*(6*x^4*log(b*x*e
/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d
^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^
3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b*c*d^2*g - 1/12*I*(6*x^4*log(b*x*e/(d*x
 + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 -
(2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3
 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*d^3*g - 1/30*I*(12*x^5*log(b*x*e/(d*x + c)
+ a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(
b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3
*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b*d^3*g - I*
A^2*a*c^3*g*x + 1/60*(-I*b^4*c^5*g - I*a*b^3*c^4*d*g + 47*I*a^2*b^2*c^3*d^2
*g - 27*I*a^3*b*c^2*d^3*g + 6*I*a^4*c*d^4*g)*B^2*log(d*x + c)/(b^3*d^2) + 1
/10*(-I*b^5*c^5*g + 5*I*a*b^4*c^4*d*g - 10*I*a^2*b^3*c^3*d^2*g + 10*I*a^3*b
^2*c^2*d^3*g - 5*I*a^4*b*c*d^4*g + I*a^5*d^5*g)*(log(b*x + a)*log((b*d*x +
a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^2) -
1/60*(12*I*B^2*b^5*d^5*g*x^5 - 3*(-13*I*b^5*c*d^4*g - 7*I*a*b^4*d^5*g)*B^2*
x^4 - 4*(-10*I*b^5*c^2*d^3*g - 19*I*a*b^4*c*d^4*g - I*a^2*b^3*d^5*g)*B^2*x^
3 + (11*I*b^5*c^3*d^2*g + 87*I*a*b^4*c^2*d^3*g + 27*I*a^2*b^3*c*d^4*g - 5*I
*a^3*b^2*d^5*g)*B^2*x^2 + (5*I*b^5*c^4*d*g + 2*I*a*b^4*c^3*d^2*g + 84*I*a^2
*b^3*c^2*d^3*g - 38*I*a^3*b^2*c*d^4*g + 7*I*a^4*b*d^5*g)*B^2*x - 3*(-4*I*B^
2*b^5*d^5*g*x^5 - 20*I*B^2*a*b^4*c^3*d^2*g*x + 5*(-3*I*b^5*c*d^4*g - I*a*b^
4*d^5*g)*B^2*x^4 + 20*(-I*b^5*c^2*d^3*g - I*a*b^4*c*d^4*g)*B^2*x^3 + 10*(-I
*b^5*c^3*d^2*g - 3*I*a*b^4*c^2*d^3*g)*B^2*x^2 + (-10*I*a^2*b^3*c^3*d^2*g +
10*I*a^3*b^2*c^2*d^3*g - 5*I*a^4*b*c*d^4*g + I*a^5*d^5*g)*B^2)*log(b*x + a)
^2 - 3*(-4*I*B^2*b^5*d^5*g*x^5 - 20*I*B^2*a*b^4*c^3*d^2*g*x + 5*(-3*I*b^5*c
*d^4*g - I*a*b^4*d^5*g)*B^2*x^4 + 20*(-I*b^5*c^2*d^3*g - I*a*b^4*c*d^4*g)*B
^2*x^3 + 10*(-I*b^5*c^3*d^2*g - 3*I*a*b^4*c^2*d^3*g)*B^2*x^2 + (I*b^5*c^5*g
 - 5*I*a*b^4*c^4*d*g)*B^2)*log(d*x + c)^2 + (24*I*B^2*b^5*d^5*g*x^5 - 12*(-
7*I*b^5*c*d^4*g - 3*I*a*b^4*d^5*g)*B^2*x^4 - 2*(-49*I*b^5*c^2*d^3*g - 70*I*
a*b^4*c*d^4*g - I*a^2*b^3*d^5*g)*B^2*x^3 - 3*(-11*I*b^5*c^3*d^2*g - 65*I*a*
b^4*c^2*d^3*g - 5*I*a^2*b^3*c*d^4*g + I*a^3*b^2*d^5*g)*B^2*x^2 - 6*(I*b^5*c
^4*d*g - 15*I*a*b^4*c^3*d^2*g - 10*I*a^2*b^3*c^2*d^3*g + 5*I*a^3*b^2*c*d^4*
g - I*a^4*b*d^5*g)*B^2*x + (-6*I*a*b^4*c^4*d*g + 57*I*a^2*b^3*c^3*d^2*g - 3
7*I*a^3*b^2*c^2*d^3*g + 11*I*a^4*b*c*d^4*g - I*a^5*d^5*g)*B^2)*log(b*x + a)

```
 + (-24*I*B^2*b^5*d^5*g*x^5 - 12*(7*I*b^5*c*d^4*g + 3*I*a*b^4*d^5*g)*B^2*x^
4 - 2*(49*I*b^5*c^2*d^3*g + 70*I*a*b^4*c*d^4*g + I*a^2*b^3*d^5*g)*B^2*x^3 -
 3*(11*I*b^5*c^3*d^2*g + 65*I*a*b^4*c^2*d^3*g + 5*I*a^2*b^3*c*d^4*g - I*a^3
*b^2*d^5*g)*B^2*x^2 - 6*(-I*b^5*c^4*d*g + 15*I*a*b^4*c^3*d^2*g + 10*I*a^2*b
^3*c^2*d^3*g - 5*I*a^3*b^2*c*d^4*g + I*a^4*b*d^5*g)*B^2*x - 6*(4*I*B^2*b^5*
d^5*g*x^5 + 20*I*B^2*a*b^4*c^3*d^2*g*x + 5*(3*I*b^5*c*d^4*g + I*a*b^4*d^5*g
)*B^2*x^4 + 20*(I*b^5*c^2*d^3*g + I*a*b^4*c*d^4*g)*B^2*x^3 + 10*(I*b^5*c^3*
d^2*g + 3*I*a*b^4*c^2*d^3*g)*B^2*x^2 + (10*I*a^2*b^3*c^3*d^2*g - 10*I*a^3*b
^2*c^2*d^3*g + 5*I*a^4*b*c*d^4*g - I*a^5*d^5*g)*B^2)*log(b*x + a))*log(d*x
+ c))/(b^4*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="fricas")
```

```
[Out] 1/20*(-4*I*B^2*b*d^3*g*x^5 - 20*I*B^2*a*c^3*g*x - 5*(3*I*B^2*b*c*d^2 + I*B^
2*a*d^3)*g*x^4 - 20*(I*B^2*b*c^2*d + I*B^2*a*c*d^2)*g*x^3 - 10*(I*B^2*b*c^3
 + 3*I*B^2*a*c^2*d)*g*x^2)*log((b*x + a)*e/(d*x + c))^2 + integral(1/10*(-1
0*I*A^2*b^2*d^4*g*x^6 - 10*I*A^2*a^2*c^4*g - 20*(2*I*A^2*b^2*c*d^3 + I*A^2*
a*b*d^4)*g*x^5 - 10*(6*I*A^2*b^2*c^2*d^2 + 8*I*A^2*a*b*c*d^3 + I*A^2*a^2*d^
4)*g*x^4 - 40*(I*A^2*b^2*c^3*d + 3*I*A^2*a*b*c^2*d^2 + I*A^2*a^2*c*d^3)*g*x
^3 - 10*(I*A^2*b^2*c^4 + 8*I*A^2*a*b*c^3*d + 6*I*A^2*a^2*c^2*d^2)*g*x^2 - 2
0*(I*A^2*a*b*c^4 + 2*I*A^2*a^2*c^3*d)*g*x + (-20*I*A*B*b^2*d^4*g*x^6 - 20*I
*A*B*a^2*c^4*g - 4*((20*I*A*B - I*B^2)*b^2*c*d^3 + (10*I*A*B + I*B^2)*a*b*d
^4)*g*x^5 - 5*(3*(8*I*A*B - I*B^2)*b^2*c^2*d^2 + 2*(16*I*A*B + I*B^2)*a*b*c
*d^3 + (4*I*A*B + I*B^2)*a^2*d^4)*g*x^4 - 20*(12*I*A*B*a*b*c^2*d^2 + (4*I*A
*B - I*B^2)*b^2*c^3*d + (4*I*A*B + I*B^2)*a^2*c*d^3)*g*x^3 - 10*((2*I*A*B -
 I*B^2)*b^2*c^4 + 2*(8*I*A*B - I*B^2)*a*b*c^3*d + 3*(4*I*A*B + I*B^2)*a^2*c
^2*d^2)*g*x^2 - 20*((2*I*A*B - I*B^2)*a*b*c^4 + (4*I*A*B + I*B^2)*a^2*c^3*d
)*g*x)*log((b*x + a)*e/(d*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(I*d*x + I*c)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^
2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)\,\left(c\,i+d\,i\,x\right)^3\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x
)
```

3.77 $\int (ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=420

$$\frac{5B^2(bc-ad)^3i^3x}{12b^3}+\frac{B^2(bc-ad)^2i^3(c+dx)^2}{12b^2d}+\frac{5B^2(bc-ad)^4i^3\log\left(\frac{a+bx}{c+dx}\right)}{12b^4d}-\frac{B(bc-ad)^3i^3(a+bx)\left(A+B\log\right.}{2b^4}$$

```
[Out] 5/12*B^2*(-a*d+b*c)^3*i^3*x/b^3+1/12*B^2*(-a*d+b*c)^2*i^3*(d*x+c)^2/b^2/d+5
/12*B^2*(-a*d+b*c)^4*i^3*ln((b*x+a)/(d*x+c))/b^4/d-1/2*B*(-a*d+b*c)^3*i^3*(
b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^4-1/4*B*(-a*d+b*c)^2*i^3*(d*x+c)^2*(A+
B*ln(e*(b*x+a)/(d*x+c)))/b^2/d-1/6*B*(-a*d+b*c)*i^3*(d*x+c)^3*(A+B*ln(e*(b*
x+a)/(d*x+c)))/b/d+1/4*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d+11/12*
B^2*(-a*d+b*c)^4*i^3*ln(d*x+c)/b^4/d+1/2*B*(-a*d+b*c)^4*i^3*(A+B*ln(e*(b*x+
a)/(d*x+c)))*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/d-1/2*B^2*(-a*d+b*c)^4*i^3*polyl
og(2,b*(d*x+c)/d/(b*x+a))/b^4/d
```

Rubi [A]

time = 0.33, antiderivative size = 420, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {2552, 2356, 2389, 2379, 2438, 2351, 31, 46}

$$-\frac{B^2i^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{2b^4d}+\frac{Bi^3(bc-ad)^4\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^4d}-\frac{Bi^3(a+bx)(bc-ad)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^4}-\frac{Bi^3(c+dx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b^2d}-\frac{Bi^3(c+dx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6bd}+\frac{i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4d}+\frac{5B^2i^3(bc-ad)^4\log\left(\frac{a+bx}{c+dx}\right)}{12b^4d}+\frac{11B^2i^3(bc-ad)^4\log(c+dx)}{12b^4d}+\frac{5B^2i^3x(bc-ad)^3}{12b^3}+\frac{B^2i^3(c+dx)^2(bc-ad)^2}{12b^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (5*B^2*(b*c - a*d)^3*i^3*x)/(12*b^3) + (B^2*(b*c - a*d)^2*i^3*(c + d*x)^2)/
(12*b^2*d) + (5*B^2*(b*c - a*d)^4*i^3*Log[(a + b*x)/(c + d*x)])/(12*b^4*d)
- (B*(b*c - a*d)^3*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b
^4) - (B*(b*c - a*d)^2*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(4*b^2*d) - (B*(b*c - a*d)*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)]))/(6*b*d) + (i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(4*d) + (11*B^2*(b*c - a*d)^4*i^3*Log[c + d*x])/(12*b^4*d) + (B*(b*c - a*d)
^4*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b
*x))])/(2*b^4*d) - (B^2*(b*c - a*d)^4*i^3*PolyLog[2, (b*(c + d*x))/(d*(a +
b*x))])/(2*b^4*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
```

```
NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2552

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(
m + 1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a
 + b*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && EqQ[n
 + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d, 0] && IntegersQ[m, p] && EqQ[d*f
- c*g, 0] && (GtQ[p, 0] || LtQ[m, -1])
```

Rubi steps

$$\int (77c+77dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{456533(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d} - \frac{B\int \frac{35153041(b\cdots}{\cdots}}{\cdots}$$

$$= \frac{456533(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d} - \frac{(456533B(bc\cdots}{\cdots}$$

$$= \frac{456533(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d} - \frac{(456533B(bc\cdots}{\cdots}$$

$$= \frac{456533(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d} - \frac{(456533B(bc\cdots}{\cdots}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} - \frac{456533B(bc-ad)^2(c+dx)^2\cdots}{4b^2d\cdots}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} - \frac{456533B^2(bc-ad)^3(a+bx)\cdots}{2b^4\cdots}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} - \frac{456533B^2(bc-ad)^3(a+bx)\cdots}{2b^4\cdots}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} + \frac{2282665B^2(bc-ad)^3x}{12b^3} + \frac{456\cdots}{\cdots}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} + \frac{2282665B^2(bc-ad)^3x}{12b^3} + \frac{456\cdots}{\cdots}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} + \frac{2282665B^2(bc-ad)^3x}{12b^3} + \frac{456\cdots}{\cdots}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} + \frac{2282665B^2(bc-ad)^3x}{12b^3} + \frac{456\cdots}{\cdots}$$

Mathematica [A]
time = 0.20, size = 389, normalized size = 0.93

$$\frac{i^3\left((c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2-\frac{B(bc-ad)\left(6Abd(bc-ad)^2x-3B(bc-ad)^2(bdx+(bc-ad)\log(a+bx))-B(bc-ad)\left(2bd(bc-ad)x+b^2(c+dx)^2+2(bc-ad)^2\log(a+bx)\right)+6Bd(bc-ad)^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+3b^2(bc-ad)(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+2b^3(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+6(bc-ad)^3\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-6B(bc-ad)^3\log(c+dx)-3B(bc-ad)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{3b^4}\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (i^3*((c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*(
6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[a + b*
x]) - B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^
2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)
] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*
b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^3*Log[
a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[c + d
*x] - 3*B*(b*c - a*d)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(
b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(3*b^4)))/(4*d
)
```

Maple [F]
time = 0.24, size = 0, normalized size = 0.00

$$\int (dix + ci)^3 \left(A + B\ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1385 vs. 2(374) = 748.
time = 0.38, size = 1385, normalized size = 3.30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] -1/4*I*A^2*d^3*x^4 - I*A^2*c*d^2*x^3 - 3/2*I*A^2*c^2*d*x^2 - 2*I*(x*log(b*x
*e/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*c^
3 - 3*I*(x^2*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 +
c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*c^2*d - I*(2*x^3*log(b*x*e/
(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*c*d^
2 - 1/12*I*(6*x^4*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)
/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2
*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*d^3 - I*A^2*c
^3*x + 1/12*(-5*I*b^3*c^4 + 26*I*a*b^2*c^3*d - 21*I*a^2*b*c^2*d^2 + 6*I*a^3
*c*d^3)*B^2*log(d*x + c)/(b^3*d) + 1/2*(I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a
^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*(log(b*x + a)*log((b*d*x + a*
d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d) - 1/12
*(3*I*B^2*b^4*d^4*x^4 - 2*(-5*I*b^4*c*d^3 - I*a*b^3*d^4)*B^2*x^3 - 2*(-5*I*
```

```
b^4*c^2*d^2 - 5*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)*B^2*x^2 + (I*b^4*c^3*d + 17*
I*a*b^3*c^2*d^2 - 7*I*a^2*b^2*c*d^3 + I*a^3*b*d^4)*B^2*x - 3*(-I*B^2*b^4*d^
4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4*c^2*d^2*x^2 - 4*I*B^2*b^4*c^3*d
*x + (-4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)
*B^2)*log(b*x + a)^2 - 3*(-I*B^2*b^4*d^4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*
B^2*b^4*c^2*d^2*x^2 - 4*I*B^2*b^4*c^3*d*x - I*B^2*b^4*c^4)*log(d*x + c)^2 +
 (6*I*B^2*b^4*d^4*x^4 - 2*(-11*I*b^4*c*d^3 - I*a*b^3*d^4)*B^2*x^3 - 3*(-9*I
*b^4*c^2*d^2 - 4*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)*B^2*x^2 - 6*(-I*b^4*c^3*d -
 6*I*a*b^3*c^2*d^2 + 4*I*a^2*b^2*c*d^3 - I*a^3*b*d^4)*B^2*x + (6*I*a*b^3*c^
3*d + 9*I*a^2*b^2*c^2*d^2 - 14*I*a^3*b*c*d^3 + 5*I*a^4*d^4)*B^2)*log(b*x +
a) + (-6*I*B^2*b^4*d^4*x^4 - 2*(11*I*b^4*c*d^3 + I*a*b^3*d^4)*B^2*x^3 - 3*(
9*I*b^4*c^2*d^2 + 4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*B^2*x^2 - 6*(I*b^4*c^3*d
 + 6*I*a*b^3*c^2*d^2 - 4*I*a^2*b^2*c*d^3 + I*a^3*b*d^4)*B^2*x - 6*(I*B^2*b^
4*d^4*x^4 + 4*I*B^2*b^4*c*d^3*x^3 + 6*I*B^2*b^4*c^2*d^2*x^2 + 4*I*B^2*b^4*c
^3*d*x + (4*I*a*b^3*c^3*d - 6*I*a^2*b^2*c^2*d^2 + 4*I*a^3*b*c*d^3 - I*a^4*d
^4)*B^2)*log(b*x + a))*log(d*x + c))/(b^4*d)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] 1/4*(-I*B^2*d^3*x^4 - 4*I*B^2*c*d^2*x^3 - 6*I*B^2*c^2*d*x^2 - 4*I*B^2*c^3*x
)*log((b*x + a)*e/(d*x + c))^2 + integral(1/2*(-2*I*A^2*b*d^4*x^5 - 2*I*A^2
*a*c^4 - 2*(4*I*A^2*b*c*d^3 + I*A^2*a*d^4)*x^4 - 4*(3*I*A^2*b*c^2*d^2 + 2*I
*A^2*a*c*d^3)*x^3 - 4*(2*I*A^2*b*c^3*d + 3*I*A^2*a*c^2*d^2)*x^2 - 2*(I*A^2*
b*c^4 + 4*I*A^2*a*c^3*d)*x + (-4*I*A*B*b*d^4*x^5 - 4*I*A*B*a*c^4 + ((-16*I*
A*B + I*B^2)*b*c*d^3 + (-4*I*A*B - I*B^2)*a*d^4)*x^4 - 4*((6*I*A*B - I*B^2)
*b*c^2*d^2 + (4*I*A*B + I*B^2)*a*c*d^3)*x^3 - 2*((8*I*A*B - 3*I*B^2)*b*c^3*
d + 3*(4*I*A*B + I*B^2)*a*c^2*d^2)*x^2 - 4*((I*A*B - I*B^2)*b*c^4 + (4*I*A*
B + I*B^2)*a*c^3*d)*x)*log((b*x + a)*e/(d*x + c)))/(b*d*x^2 + a*c + (b*c +
a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
[Out] integrate((I*d*x + I*c)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
[Out] int((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

3.78 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=712

$$\frac{B^2d(bc-ad)^2i^3x}{3b^3g}+\frac{B^2(bc-ad)^3i^3\log\left(\frac{a+bx}{c+dx}\right)}{3b^4g}-\frac{5Bd(bc-ad)^2i^3(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^4g}-\frac{B(bc-ad)}{}$$

```
[Out] 1/3*B^2*d*(-a*d+b*c)^2*i^3*x/b^3/g+1/3*B^2*(-a*d+b*c)^3*i^3*ln((b*x+a)/(d*x
+c))/b^4/g-5/3*B*d*(-a*d+b*c)^2*i^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^4
/g-1/3*B*(-a*d+b*c)*i^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2/g+2*B*(-a
*d+b*c)^3*i^3*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^4/g+d*
(-a*d+b*c)^2*i^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^4/g+1/2*(-a*d+b*c)
*i^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^2/g+1/3*i^3*(d*x+c)^3*(A+B*l
n(e*(b*x+a)/(d*x+c)))^2/b/g+2*B^2*(-a*d+b*c)^3*i^3*ln(d*x+c)/b^4/g+5/3*B*(-
a*d+b*c)^3*i^3*(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g-
(-a*d+b*c)^3*i^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^
4/g+2*B^2*(-a*d+b*c)^3*i^3*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/g-5/3*B^2*(-a
*d+b*c)^3*i^3*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g+2*B*(-a*d+b*c)^3*i^3*(A+
B*ln(e*(b*x+a)/(d*x+c)))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g+2*B^2*(-a*d+b
*c)^3*i^3*polylog(3,b*(d*x+c)/d/(b*x+a))/b^4/g
```

Rubi [A]
time = 0.75, antiderivative size = 712, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 12, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2562, 2389, 2379, 2421, 6724, 2355, 2354, 2438, 2356, 2351, 31, 46}

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x),
x]
```

```
[Out] (B^2*d*(b*c - a*d)^2*i^3*x)/(3*b^3*g) + (B^2*(b*c - a*d)^3*i^3*Log[(a + b*x
)/(c + d*x)])/(3*b^4*g) - (5*B*d*(b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(3*b^4*g) - (B*(b*c - a*d)*i^3*(c + d*x)^2*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(3*b^2*g) + (2*B*(b*c - a*d)^3*i^3*Log[(b*c -
 a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g) + (d*(b*
c - a*d)^2*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^4*g) +
((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^2
*g) + (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b*g) + (2
*B^2*(b*c - a*d)^3*i^3*Log[c + d*x])/(b^4*g) + (5*B*(b*c - a*d)^3*i^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*b^
4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 - (b
```

```
*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*PolyLog[2, (
d*(a + b*x))/(b*(c + d*x))])/(b^4*g) - (5*B^2*(b*c - a*d)^3*i^3*PolyLog[2,
(b*(c + d*x))/(d*(a + b*x))])/(3*b^4*g) + (2*B*(b*c - a*d)^3*i^3*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g)
 + (2*B^2*(b*c - a*d)^3*i^3*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g
)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
```

```
NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(78c+78dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{474552d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{6084d(bc}{}\right.$$

$$= \frac{\left(474552(bc-ad)^3\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx}{b^3} + \frac{(78d)\int(78c+}{}$$

$$= \frac{474552d(bc-ad)^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{237276(bc-}{}$$

$$= \frac{474552d(bc-ad)^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{237276(bc-}{}$$

$$= \frac{474552d(bc-ad)^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{237276(bc-}{}$$

$$= \frac{474552d(bc-ad)^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{237276(bc-}{}$$

$$= -\frac{790920ABd(bc-ad)^2x}{b^3g} - \frac{158184B(bc-ad)(c+dx)^2\left(A\right.}{b^2g}$$

$$= -\frac{790920ABd(bc-ad)^2x}{b^3g} - \frac{790920B^2d(bc-ad)^2(a+bx)\,\mathrm{l}}{b^4g}$$

$$= -\frac{790920ABd(bc-ad)^2x}{b^3g} - \frac{790920B^2d(bc-ad)^2(a+bx)\,\mathrm{l}}{b^4g}$$

$$= -\frac{790920ABd(bc-ad)^2x}{b^3g} + \frac{158184B^2d(bc-ad)^2x}{b^3g} + \frac{1581}{}$$

$$= -\frac{790920ABd(bc-ad)^2x}{b^3g} + \frac{158184B^2d(bc-ad)^2x}{b^3g} + \frac{1581}{}$$

$$= -\frac{790920ABd(bc-ad)^2x}{b^3g} + \frac{158184B^2d(bc-ad)^2x}{b^3g} + \frac{1581}{}$$

$$= -\frac{790920ABd(bc-ad)^2x}{b^3g} + \frac{158184B^2d(bc-ad)^2x}{b^3g} + \frac{1581}{}$$

$$= -\frac{790920ABd(bc-ad)^2x}{b^3g} + \frac{158184B^2d(bc-ad)^2x}{b^3g} + \frac{1581}{}$$

$$= -\frac{790920ABd(bc-ad)^2x}{} + \frac{158184B^2d(bc-ad)^2x}{} + \frac{1581}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 3976 vs. $2(712) = 1424$.
time = 2.65, size = 3976, normalized size = 5.58

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x),x]
```

```
[Out] (i^3*(36*A*b^3*B*c^3 - 72*a*A*b^2*B*c^2*d - 4*a*b^2*B^2*c^2*d + 48*a^2*A*b*
B*c*d^2 - 6*a^2*b*B^2*c*d^2 - 12*a^3*A*B*d^3 - 12*a^3*B^2*d^3 + 18*A^2*b^3*
c^2*d*x - 14*A*b^3*B*c^2*d*x + 2*b^3*B^2*c^2*d*x - 18*a*A^2*b^2*c*d^2*x + 2
4*a*A*b^2*B*c*d^2*x - 4*a*b^2*B^2*c*d^2*x + 6*a^2*A^2*b*d^3*x - 10*a^2*A*b*
B*d^3*x + 2*a^2*b*B^2*d^3*x + 9*A^2*b^3*c*d^2*x^2 - 2*A*b^3*B*c*d^2*x^2 - 3
*a*A^2*b^2*d^3*x^2 + 2*a*A*b^2*B*d^3*x^2 + 2*A^2*b^3*d^3*x^3 + 36*a*A*b^2*B
*c^2*d*Log[a/b + x] + 4*a*b^2*B^2*c^2*d*Log[a/b + x] - 36*a^2*A*b*B*c*d^2*L
og[a/b + x] - 6*a^2*b*B^2*c*d^2*Log[a/b + x] + 12*a^3*A*B*d^3*Log[a/b + x]
+ 3*a^3*B^2*d^3*Log[a/b + x] + 6*A*b^3*B*c^3*Log[a/b + x]^2 - 18*a*A*b^2*B*
c^2*d*Log[a/b + x]^2 + 18*a^2*A*b*B*c*d^2*Log[a/b + x]^2 - 6*a^3*A*B*d^3*Lo
g[a/b + x]^2 - a^3*B^2*d^3*Log[a/b + x]^2 + 4*a^3*B^2*d^3*Log[a/b + x]^3 -
36*A*b^3*B*c^3*Log[c/d + x] + 36*a*A*b^2*B*c^2*d*Log[c/d + x] - 9*a*b^2*B^2
*c^2*d*Log[c/d + x] - 12*a^2*A*b*B*c*d^2*Log[c/d + x] - 12*a^3*B^2*d^3*Log[
c/d + x] + 12*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[c/d + x] - 10*a^3*B^2*d^3*Lo
g[a/b + x]*Log[c/d + x] + 2*b^3*B^2*c^3*Log[c/d + x]^2 + 3*a*b^2*B^2*c^2*d*
Log[c/d + x]^2 - 6*a^2*b*B^2*c*d^2*Log[c/d + x]^2 + 6*A^2*b^3*c^3*Log[a + b
*x] - 18*a*A^2*b^2*c^2*d*Log[a + b*x] + 18*a^2*A^2*b*c*d^2*Log[a + b*x] - 1
8*a^2*A*b*B*c*d^2*Log[a + b*x] + 2*a^2*b*B^2*c*d^2*Log[a + b*x] - 6*a^3*A^2
*d^3*Log[a + b*x] + 10*a^3*A*B*d^3*Log[a + b*x] - 3*a^3*B^2*d^3*Log[a + b*x
] - 12*A*b^3*B*c^3*Log[a/b + x]*Log[a + b*x] + 36*a*A*b^2*B*c^2*d*Log[a/b +
 x]*Log[a + b*x] - 36*a^2*A*b*B*c*d^2*Log[a/b + x]*Log[a + b*x] + 12*a^3*A*
B*d^3*Log[a/b + x]*Log[a + b*x] - 10*a^3*B^2*d^3*Log[a/b + x]*Log[a + b*x]
- 6*a^3*B^2*d^3*Log[a/b + x]^2*Log[a + b*x] + 12*A*b^3*B*c^3*Log[c/d + x]*L
og[a + b*x] - 36*a*A*b^2*B*c^2*d*Log[c/d + x]*Log[a + b*x] + 36*a^2*A*b*B*c
*d^2*Log[c/d + x]*Log[a + b*x] - 12*a^3*A*B*d^3*Log[c/d + x]*Log[a + b*x] +
 10*a^3*B^2*d^3*Log[c/d + x]*Log[a + b*x] + 12*a^3*B^2*d^3*Log[a/b + x]*Log
[c/d + x]*Log[a + b*x] - 6*a^3*B^2*d^3*Log[c/d + x]^2*Log[a + b*x] - 12*A*b
^3*B*c^3*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 36*a*A*b^2*B*c^2*
d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 36*a^2*A*b*B*c*d^2*Log[c
/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 12*a^3*A*B*d^3*Log[c/d + x]*Log
[(d*(a + b*x))/(-(b*c) + a*d)] - 12*a^3*B^2*d^3*Log[a/b + x]*Log[c/d + x]*L
og[(d*(a + b*x))/(-(b*c) + a*d)] + 6*a^3*B^2*d^3*Log[c/d + x]^2*Log[(d*(a +
 b*x))/(-(b*c) + a*d)] - 18*b^3*B^2*c^3*Log[(b*(b*c - a*d)*e^2)/(c + d*x)]
- 18*a^2*b*B^2*c*d^2*Log[(b*(b*c - a*d)*e^2)/(c + d*x)] + 36*a*b^2*B^2*c^2*
d*Log[(b^2*(b*c - a*d)*e^2)/(c + d*x)] - 18*a*b^2*B^2*c^2*d*Log[(e*(a + b*x
```

```
))/(c + d*x)] + 30*a^2*b*B^2*c*d^2*Log[(e*(a + b*x))/(c + d*x)] - 12*a^3*B^
2*d^3*Log[(e*(a + b*x))/(c + d*x)] + 36*A*b^3*B*c^2*d*x*Log[(e*(a + b*x))/(
c + d*x)] - 14*b^3*B^2*c^2*d*x*Log[(e*(a + b*x))/(c + d*x)] - 36*a*A*b^2*B*
c*d^2*x*Log[(e*(a + b*x))/(c + d*x)] + 24*a*b^2*B^2*c*d^2*x*Log[(e*(a + b*x
))/(c + d*x)] + 12*a^2*A*b*B*d^3*x*Log[(e*(a + b*x))/(c + d*x)] - 10*a^2*b*
B^2*d^3*x*Log[(e*(a + b*x))/(c + d*x)] + 18*A*b^3*B*c*d^2*x^2*Log[(e*(a + b
*x))/(c + d*x)] - 2*b^3*B^2*c*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] - 6*a*A*
b^2*B*d^3*x^2*Log[(e*(a + b*x))/(c + d*x)] + 2*a*b^2*B^2*d^3*x^2*Log[(e*(a
+ b*x))/(c + d*x)] + 4*A*b^3*B*d^3*x^3*Log[(e*(a + b*x))/(c + d*x)] + 12*a^
3*B^2*d^3*Log[a/b + x]*Log[(e*(a + b*x))/(c + d*x)] - 6*a^3*B^2*d^3*Log[a/b
 + x]^2*Log[(e*(a + b*x))/(c + d*x)] - 12*a^2*b*B^2*c*d^2*Log[c/d + x]*Log[
(e*(a + b*x))/(c + d*x)] + 12*A*b^3*B*c^3*Log[a + b*x]*Log[(e*(a + b*x))/(c
 + d*x)] - 36*a*A*b^2*B*c^2*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 3
6*a^2*A*b*B*c*d^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 12*a^3*A*B*d^
3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 10*a^3*B^2*d^3*Log[a + b*x]*L
og[(e*(a + b*x))/(c + d*x)] + 12*a^3*B^2*d^3*Log[a/b + x]*Log[a + b*x]*Log[
(e*(a + b*x))/(c + d*x)] - 12*a^3*B^2*d^3*Log[c/d + x]*Log[a + b*x]*Log[(e*
(a + b*x))/(c + d*x)] + 12*a^3*B^2*d^3*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*
c) + a*d)]*Log[(e*(a + b*x))/(c + d*x)] + 18*a*b^2*B^2*c^2*d*Log[(e*(a + b*
x))/(c + d*x)]^2 - 27*a^2*b*B^2*c*d^2*Log[(e*(a + b*x))/(c + d*x)]^2 + 18*b
^3*B^2*c^2*d*x*Log[(e*(a + b*x))/(c + d*x)]^2 - 18*a*b^2*B^2*c*d^2*x*Log[(e
*(a + b*x))/(c + d*x)]^2 + 6*a^2*b*B^2*d^3*x*Log[(e*(a + b*x))/(c + d*x)]^2
 + 9*b^3*B^2*c*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)]^2 - 3*a*b^2*B^2*d^3*x^2
*Log[(e*(a + b*x))/(c + d*x)]^2 + 2*b^3*B^2*d^3*x^3*Log[(e*(a + b*x))/(c +
d*x)]^2 - 6*b^3*B^2*c^3*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x))
/(c + d*x)]^2 - 6*a^3*B^2*d^3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2 -
 6*a*b^2*B^2*c^2*d*Log[(e*(a + b*x))/(c + d*x)]^3 + 6*a^2*b*B^2*c*d^2*Log[(
e*(a + b*x))/(c + d*x)]^3 + 14*A*b^3*B*c^3*Log[c + d*x] - 6*b^3*B^2*c^3*Log
[c + d*x] - 6*a*A*b^2*B*c^2*d*Log[c + d*x] + 5*a*b^2*B^2*c^2*d*Log[c + d*x]
 + 22*a^2*b*B^2*c*d^2*Log[c + d*x] + 4*b^3*B^2*c^3*Log[a/b + x]*Log[c + d*x
] + 6*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[c + d*x] - 4*b^3*B^2*c^3*Log[c/d + x
]*Log[c + d*x] - 6*a*b^2*B^2*c^2*d*Log[c/d + x]...
```

Maple [F]
time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^3 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="maxima")
```

```
[Out] -3*I*A^2*c^2*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + 1/6*I*A^2*d^3*(6*a^3*lo
g(b*x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) - 3/2*I*A^2
*c*d^2*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) - I*A^2*c^3*l
og(b*g*x + a*g)/(b*g) + 1/6*(-2*I*B^2*b^3*d^3*x^3 - 3*(3*I*b^3*c*d^2 - I*a*
b^2*d^3)*B^2*x^2 - 6*(3*I*b^3*c^2*d - 3*I*a*b^2*c*d^2 + I*a^2*b*d^3)*B^2*x
- 6*(I*b^3*c^3 - 3*I*a*b^2*c^2*d + 3*I*a^2*b*c*d^2 - I*a^3*d^3)*B^2*log(b*x
 + a))*log(d*x + c)^2/(b^4*g) + integrate(1/3*(-6*I*A*B*b^4*c^4 - 3*I*B^2*b
^4*c^4 - 3*(2*I*A*B*b^4*d^4 + I*B^2*b^4*d^4)*x^4 - 12*(2*I*A*B*b^4*c*d^3 +
I*B^2*b^4*c*d^3)*x^3 - 18*(2*I*A*B*b^4*c^2*d^2 + I*B^2*b^4*c^2*d^2)*x^2 - 3
*(I*B^2*b^4*d^4*x^4 + 4*I*B^2*b^4*c*d^3*x^3 + 6*I*B^2*b^4*c^2*d^2*x^2 + 4*I
*B^2*b^4*c^3*d*x + I*B^2*b^4*c^4)*log(b*x + a)^2 - 12*(2*I*A*B*b^4*c^3*d +
I*B^2*b^4*c^3*d)*x - 6*(I*A*B*b^4*c^4 + I*B^2*b^4*c^4 + (I*A*B*b^4*d^4 + I*
B^2*b^4*d^4)*x^4 + 4*(I*A*B*b^4*c*d^3 + I*B^2*b^4*c*d^3)*x^3 + 6*(I*A*B*b^4
*c^2*d^2 + I*B^2*b^4*c^2*d^2)*x^2 + 4*(I*A*B*b^4*c^3*d + I*B^2*b^4*c^3*d)*x
)*log(b*x + a) + (6*I*A*B*b^4*c^4 + 6*I*B^2*b^4*c^4 - 2*(-3*I*A*B*b^4*d^4 -
 4*I*B^2*b^4*d^4)*x^4 + (24*I*A*B*b^4*c*d^3 + (33*I*b^4*c*d^3 - I*a*b^3*d^4
)*B^2)*x^3 - 3*(-12*I*A*B*b^4*c^2*d^2 + (-18*I*b^4*c^2*d^2 + 3*I*a*b^3*c*d^
3 - I*a^2*b^2*d^4)*B^2)*x^2 - 6*(-4*I*A*B*b^4*c^3*d + (-4*I*b^4*c^3*d - 3*I
*a*b^3*c^2*d^2 + 3*I*a^2*b^2*c*d^3 - I*a^3*b*d^4)*B^2)*x - 6*(-I*B^2*b^4*d^
4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4*c^2*d^2*x^2 + (-5*I*b^4*c^3*d +
 3*I*a*b^3*c^2*d^2 - 3*I*a^2*b^2*c*d^3 + I*a^3*b*d^4)*B^2*x + (-I*b^4*c^4 -
 I*a*b^3*c^3*d + 3*I*a^2*b^2*c^2*d^2 - 3*I*a^3*b*c*d^3 + I*a^4*d^4)*B^2)*lo
g(b*x + a))*log(d*x + c))/(b^5*d*g*x^2 + a*b^4*c*g + (b^5*c*g + a*b^4*d*g)*
x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="fricas")
```

```
[Out] integral((-I*A^2*d^3*x^3 - 3*I*A^2*c*d^2*x^2 - 3*I*A^2*c^2*d*x - I*A^2*c^3
+ (-I*B^2*d^3*x^3 - 3*I*B^2*c*d^2*x^2 - 3*I*B^2*c^2*d*x - I*B^2*c^3)*log((b
*x + a)*e/(d*x + c))^2 - 2*(I*A*B*d^3*x^3 + 3*I*A*B*c*d^2*x^2 + 3*I*A*B*c^2
*d*x + I*A*B*c^3)*log((b*x + a)*e/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g),x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="giac")
[Out] integrate((I*d*x + I*c)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x),
x)
[Out] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x),
 x)
```

3.79 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=692

$$-\frac{2B^2(bc-ad)^2i^3(c+dx)}{b^3g^2(a+bx)}-\frac{Bd^2(bc-ad)i^3(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^2}-\frac{2B(bc-ad)^2i^3(c+dx)\left(A+B\right.}{b^3g^2(a+bx)}$$

```
[Out] -2*B^2*(-a*d+b*c)^2*i^3*(d*x+c)/b^3/g^2/(b*x+a)-B*d^2*(-a*d+b*c)*i^3*(b*x+a
)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^4/g^2-2*B*(-a*d+b*c)^2*i^3*(d*x+c)*(A+B*ln(
e*(b*x+a)/(d*x+c)))/b^3/g^2/(b*x+a)+4*B*d*(-a*d+b*c)^2*i^3*ln((-a*d+b*c)/b/
(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^4/g^2+2*d^2*(-a*d+b*c)*i^3*(b*x+a)*(
A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^4/g^2-(-a*d+b*c)^2*i^3*(d*x+c)*(A+B*ln(e*(b*
x+a)/(d*x+c)))^2/b^3/g^2/(b*x+a)+1/2*d*i^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x
+c)))^2/b^2/g^2+B^2*d*(-a*d+b*c)^2*i^3*ln(d*x+c)/b^4/g^2+B*d*(-a*d+b*c)^2*i
^3*(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g^2-3*d*(-a*d+
b*c)^2*i^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g^2+
4*B^2*d*(-a*d+b*c)^2*i^3*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/g^2-B^2*d*(-a*d
+b*c)^2*i^3*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g^2+6*B*d*(-a*d+b*c)^2*i^3*(
A+B*ln(e*(b*x+a)/(d*x+c)))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g^2+6*B^2*d*(
-a*d+b*c)^2*i^3*polylog(3,b*(d*x+c)/d/(b*x+a))/b^4/g^2
```

Rubi [A]
time = 0.52, antiderivative size = 692, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 14, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2562, 2395, 2342, 2341, 2356, 2389, 2379, 2438, 2351, 31, 2355, 2354, 2421, 6724}

$$\frac{6Bdi^3(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^2}+\frac{4B^2di^3(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^2}-\frac{B^2di^3(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^2}+\frac{6B^2di^3(bc-ad)^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^2}+\frac{2d^2i^3(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^4g^2}-\frac{Bd^2i^3(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^2}+\frac{4Bdi^3(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^2}-\frac{3di^3(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^4g^2}+\frac{Bdi^3(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^2}-\frac{i^3(c+dx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^3g^2(a+bx)}-\frac{2Bi^3(c+dx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2(a+bx)}+\frac{di^3(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2b^2g^2}+\frac{B^2di^3(bc-ad)^2\log(c+dx)}{b^4g^2}-\frac{2B^2i^3(c+dx)(bc-ad)^2}{b^3g^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*i^3*(c + d*x))/(b^3*g^2*(a + b*x)) - (B*d^2*(b*c - a*
d)*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) - (2*B*(b*
c - a*d)^2*i^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^2*(a
+ b*x)) + (4*B*d*(b*c - a*d)^2*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(
A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c +
d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^2*(a + b*x)) + (d*i^3*(
c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^2*g^2) + (B^2*d*(b*
c - a*d)^2*i^3*Log[c + d*x])/(b^4*g^2) + (B*d*(b*c - a*d)^2*i^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) -
```

```
 (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 - (b*(
c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (4*B^2*d*(b*c - a*d)^2*i^3*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))])/(b^4*g^2) - (B^2*d*(b*c - a*d)^2*i^3*PolyLog
[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (6*B*d*(b*c - a*d)^2*i^3*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(
b^4*g^2) + (6*B^2*d*(b*c - a*d)^2*i^3*PolyLog[3, (b*(c + d*x))/(d*(a + b*x)
)])/(b^4*g^2)
```

<u>Rule 31</u>

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

<u>Rule 2341</u>

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

<u>Rule 2342</u>

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

<u>Rule 2351</u>

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

<u>Rule 2354</u>

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

<u>Rule 2355</u>

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(79c+79dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{493039d^2(3bc-2ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d\right.$$

$$= \frac{(493039d^3)\int x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{b^2g^2} + \frac{(493039d^2(3bc-\right.$$

$$= \frac{493039d^2(3bc-2ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d^3x^2}{}$$

$$= \frac{493039d^2(3bc-2ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d^3x^2}{}$$

$$= \frac{493039d^2(3bc-2ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d^3x^2}{}$$

$$= \frac{493039d^2(3bc-2ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d^3x^2}{}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B(bc-ad)^3\left(A+B\log\left(\right.\right.}{b^4g^2(a+bx)}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{493039B^2d^2(bc-ad)(a+bx)\log}{b^4g^2}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{493039B^2d^2(bc-ad)(a+bx)\log}{b^4g^2}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B^2(bc-ad)^3}{b^4g^2(a+bx)} - \frac{986078B}{}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B^2(bc-ad)^3}{b^4g^2(a+bx)} - \frac{986078B}{}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B^2(bc-ad)^3}{b^4g^2(a+bx)} - \frac{986078B}{}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B^2(bc-ad)^3}{b^4g^2(a+bx)} - \frac{986078B}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 5108 vs. $2(692) = 1384$.
time = 13.07, size = 5108, normalized size = 7.38

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^2,x]
```

```
[Out] Result too large to show
```

Maple [F]
time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{(dix + ci)^3 \left(A + B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{(bgx + ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="maxima")
```

```
[Out] 3*I*A^2*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*
g^2))*c*d^2 - 1/2*I*(2*a^3/(b^5*g^2*x + a*b^4*g^2) + 6*a^2*log(b*x + a)/(b^
4*g^2) + (b*x^2 - 4*a*x)/(b^3*g^2))*A^2*d^3 - 3*I*A^2*c^2*d*(a/(b^3*g^2*x +
 a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) + 2*I*A*B*c^3*(log(b*x*e/(d*x + c) +
a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2*x + a*b*g^2) + d*log(b*x
+ a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + I*A^2*
c^3/(b^2*g^2*x + a*b*g^2) - 1/2*(I*B^2*b^3*d^3*x^3 - 3*(-2*I*b^3*c*d^2 + I*
a*b^2*d^3)*B^2*x^2 - 2*(-3*I*a*b^2*c*d^2 + 2*I*a^2*b*d^3)*B^2*x - 2*(I*b^3*
c^3 - 3*I*a*b^2*c^2*d + 3*I*a^2*b*c*d^2 - I*a^3*d^3)*B^2 - 6*((-I*b^3*c^2*d
 + 2*I*a*b^2*c*d^2 - I*a^2*b*d^3)*B^2*x + (-I*a*b^2*c^2*d + 2*I*a^2*b*c*d^2
 - I*a^3*d^3)*B^2)*log(b*x + a))*log(d*x + c)^2/(b^5*g^2*x + a*b^4*g^2) + i
ntegrate((-I*B^2*b^4*c^4 + (-2*I*A*B*b^4*d^4 - I*B^2*b^4*d^4)*x^4 - 4*(2*I*
A*B*b^4*c*d^3 + I*B^2*b^4*c*d^3)*x^3 - 6*(2*I*A*B*b^4*c^2*d^2 + I*B^2*b^4*c
```

```
^2*d^2)*x^2 + (-I*B^2*b^4*d^4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4*c^2
*d^2*x^2 - 4*I*B^2*b^4*c^3*d*x - I*B^2*b^4*c^4)*log(b*x + a)^2 - 2*(3*I*A*B
*b^4*c^3*d + 2*I*B^2*b^4*c^3*d)*x - 2*(I*B^2*b^4*c^4 + (I*A*B*b^4*d^4 + I*B
^2*b^4*d^4)*x^4 + 4*(I*A*B*b^4*c*d^3 + I*B^2*b^4*c*d^3)*x^3 + 6*(I*A*B*b^4*
c^2*d^2 + I*B^2*b^4*c^2*d^2)*x^2 + (3*I*A*B*b^4*c^3*d + 4*I*B^2*b^4*c^3*d)*
x)*log(b*x + a) + ((2*I*A*B*b^4*d^4 + 3*I*B^2*b^4*d^4)*x^4 - 2*(-4*I*A*B*b^
4*c*d^3 + (-7*I*b^4*c*d^3 + I*a*b^3*d^4)*B^2)*x^3 - 2*(-I*b^4*c^4 + I*a*b^3
*c^3*d - 3*I*a^2*b^2*c^2*d^2 + 3*I*a^3*b*c*d^3 - I*a^4*d^4)*B^2 + (12*I*A*B
*b^4*c^2*d^2 + (12*I*b^4*c^2*d^2 + 12*I*a*b^3*c*d^3 - 7*I*a^2*b^2*d^4)*B^2)
*x^2 - 2*(-3*I*A*B*b^4*c^3*d + (-3*I*b^4*c^3*d - 3*I*a*b^3*c^2*d^2 + I*a^3*
b*d^4)*B^2)*x - 2*(-I*B^2*b^4*d^4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 + 3*(-3*I*b^4
*c^2*d^2 + 2*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*B^2*x^2 + 2*(-2*I*b^4*c^3*d - 3
*I*a*b^3*c^2*d^2 + 6*I*a^2*b^2*c*d^3 - 3*I*a^3*b*d^4)*B^2*x + (-I*b^4*c^4 -
 3*I*a^2*b^2*c^2*d^2 + 6*I*a^3*b*c*d^3 - 3*I*a^4*d^4)*B^2)*log(b*x + a))*lo
g(d*x + c))/(b^6*d*g^2*x^3 + a^2*b^4*c*g^2 + (b^6*c*g^2 + 2*a*b^5*d*g^2)*x^
2 + (2*a*b^5*c*g^2 + a^2*b^4*d*g^2)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="fricas")
```

```
[Out] integral((-I*A^2*d^3*x^3 - 3*I*A^2*c*d^2*x^2 - 3*I*A^2*c^2*d*x - I*A^2*c^3
+ (-I*B^2*d^3*x^3 - 3*I*B^2*c*d^2*x^2 - 3*I*B^2*c^2*d*x - I*B^2*c^3)*log((b
*x + a)*e/(d*x + c))^2 - 2*(I*A*B*d^3*x^3 + 3*I*A*B*c*d^2*x^2 + 3*I*A*B*c^2
*d*x + I*A*B*c^3)*log((b*x + a)*e/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*x +
a^2*g^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{(a\,g+b\,g\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
2,x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
2, x)
```

3.80 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=604

$$-\frac{4B^2d(bc-ad)i^3(c+dx)}{b^3g^3(a+bx)}-\frac{B^2(bc-ad)i^3(c+dx)^2}{4b^2g^3(a+bx)^2}-\frac{4Bd(bc-ad)i^3(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)}-\frac{B(bc$$

```
[Out] -4*B^2*d*(-a*d+b*c)*i^3*(d*x+c)/b^3/g^3/(b*x+a)-1/4*B^2*(-a*d+b*c)*i^3*(d*x
+c)^2/b^2/g^3/(b*x+a)^2-4*B*d*(-a*d+b*c)*i^3*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x
+c)))/b^3/g^3/(b*x+a)-1/2*B*(-a*d+b*c)*i^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x
+c)))/b^2/g^3/(b*x+a)^2+2*B*d^2*(-a*d+b*c)*i^3*ln((-a*d+b*c)/b/(d*x+c))*(A+
B*ln(e*(b*x+a)/(d*x+c)))/b^4/g^3+d^3*i^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c))
)^2/b^4/g^3-2*d*(-a*d+b*c)*i^3*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^3/g^
3/(b*x+a)-1/2*(-a*d+b*c)*i^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^2/g^
3/(b*x+a)^2-3*d^2*(-a*d+b*c)*i^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2*ln(1-b*(d*x+
c)/d/(b*x+a))/b^4/g^3+2*B^2*d^2*(-a*d+b*c)*i^3*polylog(2,d*(b*x+a)/b/(d*x+c
))/b^4/g^3+6*B*d^2*(-a*d+b*c)*i^3*(A+B*ln(e*(b*x+a)/(d*x+c)))*polylog(2,b*(
d*x+c)/d/(b*x+a))/b^4/g^3+6*B^2*d^2*(-a*d+b*c)*i^3*polylog(3,b*(d*x+c)/d/(b
*x+a))/b^4/g^3
```

Rubi [A]
time = 0.42, antiderivative size = 604, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$,
Rules used = {2562, 2395, 2342, 2341, 2355, 2354, 2438, 2379, 2421, 6724}

$$\frac{6Bd^2i^3(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^3}+\frac{2B^2d^2i^3(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^3}+\frac{6B^2d^2i^3(bc-ad)\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^3}+\frac{d^3i^3(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^4g^3}+\frac{2Bd^2i^3(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^3}-\frac{3d^2i^3(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^4g^3}-\frac{2di^3(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b^3g^3(a+bx)}-\frac{4Bdi^3(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^3(a+bx)}-\frac{i^3(c+dx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2b^2g^3(a+bx)^2}-\frac{Bi^3(c+dx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g^3(a+bx)^2}-\frac{4B^2di^3(c+dx)(bc-ad)}{b^3g^3(a+bx)}-\frac{B^2i^3(c+dx)^2(bc-ad)}{4b^2g^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
3,x]
```

```
[Out] (-4*B^2*d*(b*c - a*d)*i^3*(c + d*x))/(b^3*g^3*(a + b*x)) - (B^2*(b*c - a*d)
*i^3*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) - (4*B*d*(b*c - a*d)*i^3*(c + d*x
)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^3*(a + b*x)) - (B*(b*c - a*d
)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^3*(a + b*x
)^2) + (2*B*d^2*(b*c - a*d)*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(b^4*g^3) + (d^3*i^3*(a + b*x)*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log
[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*(c + d
*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^2*g^3*(a + b*x)^2) - (3*
d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 - (b*(c +
d*x))/(d*(a + b*x))])/(b^4*g^3) + (2*B^2*d^2*(b*c - a*d)*i^3*PolyLog[2, (d*
(a + b*x))/(b*(c + d*x))])/(b^4*g^3) + (6*B*d^2*(b*c - a*d)*i^3*(A + B*Log[
```

```
(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3
) + (6*B^2*d^2*(b*c - a*d)*i^3*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^
4*g^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(80c+80dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx = \int\left(\frac{512000d^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}+\frac{512000(bc-ad)^3\left(\right.}{b^3g^3(}\right.$$

$$= \frac{(512000d^3)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx}{b^3g^3}+\frac{(1536000d^2(bc-}{}$$

$$= \frac{512000d^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}-\frac{256000(bc-ad)^3\left(A-\right.}{b^4g^3(a+}$$

$$= \frac{512000d^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}-\frac{256000(bc-ad)^3\left(A-\right.}{b^4g^3(a+}$$

$$= \frac{512000d^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}-\frac{256000(bc-ad)^3\left(A-\right.}{b^4g^3(a+}$$

$$= \frac{512000d^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}-\frac{256000(bc-ad)^3\left(A-\right.}{b^4g^3(a+}$$

$$= -\frac{256000B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2}-\frac{2560000Bd(}{}$$

$$= -\frac{256000B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2}-\frac{2560000Bd(}{}$$

$$= -\frac{1536000B^2d^2(bc-ad)\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^3}-\frac{25600}{}$$

$$= -\frac{128000B^2(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{2304000B^2d(bc-ad)^2}{b^4g^3(a+bx)}-\frac{2304000}{}$$

$$= -\frac{128000B^2(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{2304000B^2d(bc-ad)^2}{b^4g^3(a+bx)}-\frac{2304000}{}$$

$$= -\frac{128000B^2(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{2304000B^2d(bc-ad)^2}{b^4g^3(a+bx)}-\frac{2304000}{}$$

$$= -\frac{128000B^2(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{2304000B^2d(bc-ad)^2}{b^4g^3(a+bx)}-\frac{2304000}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 6295 vs. $2(604) = 1208$.
time = 11.08, size = 6295, normalized size = 10.42

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^3,x]
```

```
[Out] Result too large to show
```

Maple [F]
time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{(dix + ci)^3 \left(A + B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{(bgx + ag)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="maxima")
```

```
[Out] 3/2*I*A*B*c^2*d*(2*(2*b*x + a)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^4*g^
3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*
d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3
*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3
*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a
*b^3*c*d + a^2*b^2*d^2)*g^3)) + 1/2*I*A^2*d^3*((6*a^2*b*x + 5*a^3)/(b^6*g^3
*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*log(b*x + a)/(b^4
*g^3)) - 3/2*I*A^2*c*d^2*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x +
a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) - 1/2*I*A*B*c^3*((2*b*d*x - b*c +
3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^
2*c - a^3*b*d)*g^3) - 2*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2 +
 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d +
a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g
```

```
^3)) + 3/2*I*(2*b*x + a)*A^2*c^2*d/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g
^3) + 1/2*I*A^2*c^3/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 1/2*(-2*I*B
^2*b^3*d^3*x^3 - 4*I*B^2*a*b^2*d^3*x^2 - 2*(-3*I*b^3*c^2*d + 6*I*a*b^2*c*d^
2 - 2*I*a^2*b*d^3)*B^2*x + (I*b^3*c^3 + 3*I*a*b^2*c^2*d - 9*I*a^2*b*c*d^2 +
 5*I*a^3*d^3)*B^2 - 6*((I*b^3*c*d^2 - I*a*b^2*d^3)*B^2*x^2 + 2*(I*a*b^2*c*d
^2 - I*a^2*b*d^3)*B^2*x + (I*a^2*b*c*d^2 - I*a^3*d^3)*B^2)*log(b*x + a))*lo
g(d*x + c)^2/(b^6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) + integrate((-4*I*
B^2*b^4*c^3*d*x - I*B^2*b^4*c^4 + (-2*I*A*B*b^4*d^4 - I*B^2*b^4*d^4)*x^4 -
4*(2*I*A*B*b^4*c*d^3 + I*B^2*b^4*c*d^3)*x^3 - 6*(I*A*B*b^4*c^2*d^2 + I*B^2*
b^4*c^2*d^2)*x^2 + (-I*B^2*b^4*d^4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^
4*c^2*d^2*x^2 - 4*I*B^2*b^4*c^3*d*x - I*B^2*b^4*c^4)*log(b*x + a)^2 - 2*(4*
I*B^2*b^4*c^3*d*x + I*B^2*b^4*c^4 + (I*A*B*b^4*d^4 + I*B^2*b^4*d^4)*x^4 + 4
*(I*A*B*b^4*c*d^3 + I*B^2*b^4*c*d^3)*x^3 + 3*(I*A*B*b^4*c^2*d^2 + 2*I*B^2*b
^4*c^2*d^2)*x^2)*log(b*x + a) - (2*(-I*A*B*b^4*d^4 - 2*I*B^2*b^4*d^4)*x^4 -
 (7*I*b^4*c^3*d - 9*I*a*b^3*c^2*d^2 + 21*I*a^2*b^2*c*d^3 - 9*I*a^3*b*d^4)*B
^2*x + 2*(-4*I*A*B*b^4*c*d^3 + (-4*I*b^4*c*d^3 - 3*I*a*b^3*d^4)*B^2)*x^3 -
(2*I*b^4*c^4 - I*a*b^3*c^3*d - 3*I*a^2*b^2*c^2*d^2 + 9*I*a^3*b*c*d^3 - 5*I*
a^4*d^4)*B^2 + 6*(-I*A*B*b^4*c^2*d^2 + (-I*b^4*c^2*d^2 - 2*I*a*b^3*c*d^3)*B
^2)*x^2 + 2*(-I*B^2*b^4*d^4*x^4 + (-7*I*b^4*c*d^3 + 3*I*a*b^3*d^4)*B^2*x^3
+ 3*(-2*I*b^4*c^2*d^2 - 3*I*a*b^3*c*d^3 + 3*I*a^2*b^2*d^4)*B^2*x^2 + (-4*I*
b^4*c^3*d - 9*I*a^2*b^2*c*d^3 + 9*I*a^3*b*d^4)*B^2*x + (-I*b^4*c^4 - 3*I*a^
3*b*c*d^3 + 3*I*a^4*d^4)*B^2)*log(b*x + a))*log(d*x + c))/(b^7*d*g^3*x^4 +
a^3*b^4*c*g^3 + (b^7*c*g^3 + 3*a*b^6*d*g^3)*x^3 + 3*(a*b^6*c*g^3 + a^2*b^5*
d*g^3)*x^2 + (3*a^2*b^5*c*g^3 + a^3*b^4*d*g^3)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="fricas")
```

```
[Out] integral((-I*A^2*d^3*x^3 - 3*I*A^2*c*d^2*x^2 - 3*I*A^2*c^2*d*x - I*A^2*c^3
+ (-I*B^2*d^3*x^3 - 3*I*B^2*c*d^2*x^2 - 3*I*B^2*c^2*d*x - I*B^2*c^3)*log((b
*x + a)*e/(d*x + c))^2 - 2*(I*A*B*d^3*x^3 + 3*I*A*B*c*d^2*x^2 + 3*I*A*B*c^2
*d*x + I*A*B*c^3)*log((b*x + a)*e/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^
2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^3\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}{{\left(a\,g+b\,g\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
3,x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
3, x)
```

3.81 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=147

$$-\frac{B^2i^3(c+dx)^4}{32(bc-ad)g^5(a+bx)^4}-\frac{Bi^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8(bc-ad)g^5(a+bx)^4}-\frac{i^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4(bc-ad)g^5(a+bx)^4}$$

```
[Out] -1/32*B^2*i^3*(d*x+c)^4/(-a*d+b*c)/g^5/(b*x+a)^4-1/8*B*i^3*(d*x+c)^4*(A+B*l
n(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)/g^5/(b*x+a)^4-1/4*i^3*(d*x+c)^4*(A+B*ln(e*
(b*x+a)/(d*x+c)))^2/(-a*d+b*c)/g^5/(b*x+a)^4
```

Rubi [A]

time = 0.11, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {2562, 2342, 2341}

$$-\frac{i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)}-\frac{Bi^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)}-\frac{B^2i^3(c+dx)^4}{32g^5(a+bx)^4(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
5,x]
```

```
[Out] -1/32*(B^2*i^3*(c + d*x)^4)/((b*c - a*d)*g^5*(a + b*x)^4) - (B*i^3*(c + d*x
)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)*g^5*(a + b*x)^4) -
 (i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*(b*c - a*d)*g^
5*(a + b*x)^4)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
```

```
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(81c+81dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx = \int \left(\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^5} + \frac{1594323d(\right.$$

$$= \frac{(531441d^3)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}\,dx}{b^3g^5} + \frac{(1594323d^2(bc-ad))}{b^3}$$

$$= -\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^4g^5(a+bx)^4} - \frac{531441d(bc-}{}$$

$$= -\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^4g^5(a+bx)^4} - \frac{531441d(bc-}{}$$

$$= -\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^4g^5(a+bx)^4} - \frac{531441d(bc-}{}$$

$$= -\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^4g^5(a+bx)^4} - \frac{531441d(bc-}{}$$

$$= -\frac{531441B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^4g^5(a+bx)^4} - \frac{531441Bd(b}{}$$

$$= -\frac{531441B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^4g^5(a+bx)^4} - \frac{531441Bd(b}{}$$

$$= -\frac{531441B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^4g^5(a+bx)^4} - \frac{531441Bd(b}{}$$

$$= -\frac{531441B^2(bc-ad)^3}{32b^4g^5(a+bx)^4} - \frac{531441B^2d(bc-ad)^2}{8b^4g^5(a+bx)^3} - \frac{1594323B}{16b^4g^5}$$

$$= -\frac{531441B^2(bc-ad)^3}{32b^4g^5(a+bx)^4} - \frac{531441B^2d(bc-ad)^2}{8b^4g^5(a+bx)^3} - \frac{1594323B}{16b^4g^5}$$

$$= -\frac{531441B^2(bc-ad)^3}{32b^4g^5(a+bx)^4} - \frac{531441B^2d(bc-ad)^2}{8b^4g^5(a+bx)^3} - \frac{1594323B}{16b^4g^5}$$

$$= -\frac{531441B^2(bc-ad)^3}{32b^4g^5(a+bx)^4} - \frac{531441B^2d(bc-ad)^2}{8b^4g^5(a+bx)^3} - \frac{1594323B}{16b^4g^5}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.99, size = 2470, normalized size = 16.80

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^5,x]
```

```
[Out] -1/32*(i^3*(8*A^2*b^4*c^4 + 4*A*b^4*B*c^4 + b^4*B^2*c^4 - 8*a^4*A^2*d^4 - 4
*a^4*A*B*d^4 - a^4*B^2*d^4 + 32*A^2*b^4*c^3*d*x + 16*A*b^4*B*c^3*d*x + 4*b^
4*B^2*c^3*d*x - 32*a^3*A^2*b*d^4*x - 16*a^3*A*b*B*d^4*x - 4*a^3*b*B^2*d^4*x
 + 48*A^2*b^4*c^2*d^2*x^2 + 24*A*b^4*B*c^2*d^2*x^2 + 6*b^4*B^2*c^2*d^2*x^2
- 48*a^2*A^2*b^2*d^4*x^2 - 24*a^2*A*b^2*B*d^4*x^2 - 6*a^2*b^2*B^2*d^4*x^2 +
 32*A^2*b^4*c*d^3*x^3 + 16*A*b^4*B*c*d^3*x^3 + 4*b^4*B^2*c*d^3*x^3 - 32*a*A
^2*b^3*d^4*x^3 - 16*a*A*b^3*B*d^4*x^3 - 4*a*b^3*B^2*d^4*x^3 + 16*a^4*A*B*d^
4*Log[a + b*x] + 4*a^4*B^2*d^4*Log[a + b*x] + 64*a^3*A*b*B*d^4*x*Log[a + b*
x] + 16*a^3*b*B^2*d^4*x*Log[a + b*x] + 96*a^2*A*b^2*B*d^4*x^2*Log[a + b*x]
+ 24*a^2*b^2*B^2*d^4*x^2*Log[a + b*x] + 64*a*A*b^3*B*d^4*x^3*Log[a + b*x] +
 16*a*b^3*B^2*d^4*x^3*Log[a + b*x] + 16*A*b^4*B*d^4*x^4*Log[a + b*x] + 4*b^
4*B^2*d^4*x^4*Log[a + b*x] - 8*a^4*B^2*d^4*Log[a + b*x]^2 - 32*a^3*b*B^2*d^
4*x*Log[a + b*x]^2 - 48*a^2*b^2*B^2*d^4*x^2*Log[a + b*x]^2 - 32*a*b^3*B^2*d
^4*x^3*Log[a + b*x]^2 - 8*b^4*B^2*d^4*x^4*Log[a + b*x]^2 + 16*A*b^4*B*c^4*L
og[(e*(a + b*x))/(c + d*x)] + 4*b^4*B^2*c^4*Log[(e*(a + b*x))/(c + d*x)] -
16*a^4*A*B*d^4*Log[(e*(a + b*x))/(c + d*x)] - 4*a^4*B^2*d^4*Log[(e*(a + b*x
))/(c + d*x)] + 64*A*b^4*B*c^3*d*x*Log[(e*(a + b*x))/(c + d*x)] + 16*b^4*B^
2*c^3*d*x*Log[(e*(a + b*x))/(c + d*x)] - 64*a^3*A*b*B*d^4*x*Log[(e*(a + b*x
))/(c + d*x)] - 16*a^3*b*B^2*d^4*x*Log[(e*(a + b*x))/(c + d*x)] + 96*A*b^4*
B*c^2*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] + 24*b^4*B^2*c^2*d^2*x^2*Log[(e*
(a + b*x))/(c + d*x)] - 96*a^2*A*b^2*B*d^4*x^2*Log[(e*(a + b*x))/(c + d*x)]
 - 24*a^2*b^2*B^2*d^4*x^2*Log[(e*(a + b*x))/(c + d*x)] + 64*A*b^4*B*c*d^3*x
^3*Log[(e*(a + b*x))/(c + d*x)] + 16*b^4*B^2*c*d^3*x^3*Log[(e*(a + b*x))/(c
 + d*x)] - 64*a*A*b^3*B*d^4*x^3*Log[(e*(a + b*x))/(c + d*x)] - 16*a*b^3*B^2
*d^4*x^3*Log[(e*(a + b*x))/(c + d*x)] + 16*a^4*B^2*d^4*Log[a + b*x]*Log[(e*
(a + b*x))/(c + d*x)] + 64*a^3*b*B^2*d^4*x*Log[a + b*x]*Log[(e*(a + b*x))/(
c + d*x)] + 96*a^2*b^2*B^2*d^4*x^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)
] + 64*a*b^3*B^2*d^4*x^3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 16*b^4
*B^2*d^4*x^4*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 8*b^4*B^2*c^4*Log[
(e*(a + b*x))/(c + d*x)]^2 - 8*a^4*B^2*d^4*Log[(e*(a + b*x))/(c + d*x)]^2 +
 32*b^4*B^2*c^3*d*x*Log[(e*(a + b*x))/(c + d*x)]^2 - 32*a^3*b*B^2*d^4*x*Log
[(e*(a + b*x))/(c + d*x)]^2 + 48*b^4*B^2*c^2*d^2*x^2*Log[(e*(a + b*x))/(c +
 d*x)]^2 - 48*a^2*b^2*B^2*d^4*x^2*Log[(e*(a + b*x))/(c + d*x)]^2 + 32*b^4*B
^2*c*d^3*x^3*Log[(e*(a + b*x))/(c + d*x)]^2 - 32*a*b^3*B^2*d^4*x^3*Log[(e*(
a + b*x))/(c + d*x)]^2 - 16*a^4*A*B*d^4*Log[c + d*x] - 4*a^4*B^2*d^4*Log[c
```

```
+ d*x] - 64*a^3*A*b*B*d^4*x*Log[c + d*x] - 16*a^3*b*B^2*d^4*x*Log[c + d*x]
- 96*a^2*A*b^2*B*d^4*x^2*Log[c + d*x] - 24*a^2*b^2*B^2*d^4*x^2*Log[c + d*x]
 - 64*a*A*b^3*B*d^4*x^3*Log[c + d*x] - 16*a*b^3*B^2*d^4*x^3*Log[c + d*x] -
16*A*b^4*B*d^4*x^4*Log[c + d*x] - 4*b^4*B^2*d^4*x^4*Log[c + d*x] + 16*a^4*B
^2*d^4*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 64*a^3*b*B^2*d^4*x*
Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 96*a^2*b^2*B^2*d^4*x^2*Log
[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 64*a*b^3*B^2*d^4*x^3*Log[(d*(
a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 16*b^4*B^2*d^4*x^4*Log[(d*(a + b*x
))/(-(b*c) + a*d)]*Log[c + d*x] - 16*a^4*B^2*d^4*Log[(e*(a + b*x))/(c + d*x
)]*Log[c + d*x] - 64*a^3*b*B^2*d^4*x*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d
*x] - 96*a^2*b^2*B^2*d^4*x^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 64
*a*b^3*B^2*d^4*x^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 16*b^4*B^2*d
^4*x^4*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 8*a^4*B^2*d^4*Log[c + d*
x]^2 - 32*a^3*b*B^2*d^4*x*Log[c + d*x]^2 - 48*a^2*b^2*B^2*d^4*x^2*Log[c + d
*x]^2 - 32*a*b^3*B^2*d^4*x^3*Log[c + d*x]^2 - 8*b^4*B^2*d^4*x^4*Log[c + d*x
]^2 + 16*a^4*B^2*d^4*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 64*a^3*b
*B^2*d^4*x*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 96*a^2*b^2*B^2*d^4
*x^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 64*a*b^3*B^2*d^4*x^3*Log
[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 16*b^4*B^2*d^4*x^4*Log[a + b*x]*
Log[(b*(c + d*x))/(b*c - a*d)] + 16*B^2*d^4*(a + b*x)^4*PolyLog[2, (d*(a +
b*x))/(-(b*c) + a*d)] + 16*B^2*d^4*(a + b*x)^4*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)]))/(b^4*(b*c - a*d)*g^5*(a + b*x)^4)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 366 vs. $2(141) = 282$.
time = 0.78, size = 367, normalized size = 2.50 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/4*i^3*d^2*e^3/(a*d-b*c)^2/g^5*A^2/(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^4+2*i^3*d^2*e^3/(a*d-b*c)^2/g^5*A*B*(-1/4/(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/16/(b*e/d+(a*d-b*c)*e/d/(d*x+c
))^4)+i^3*d^2*e^3/(a*d-b*c)^2/g^5*B^2*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-1/8/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))-1/32/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4))
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 11664 vs. $2(134) = 268$.
time = 1.55, size = 11664, normalized size = 79.35

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="maxima")
```

```
[Out] 1/4*I*(4*b*x + a)*B^2*c^2*d*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^5
*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5)
 + 1/4*I*(6*b^2*x^2 + 4*a*b*x + a^2)*B^2*c*d^2*log(b*x*e/(d*x + c) + a*e/(d
*x + c))^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g
^5*x + a^4*b^3*g^5) + 1/4*I*(4*b^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*B^2
*d^3*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3
+ 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) - 1/288*I*(12*((12*b^3
*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^
3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x
)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a
*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^
2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a
^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*
b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4*log(
b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 +
a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3
*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b*x*e/(d*x + c) + a*e/(d*
x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^2 - 576*a^3*b*c*d
^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(13*b^4*c^2*d^2 - 17
6*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 +
6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)^2 + 72*(b^4*d^4*x
^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(d*x
 + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2*c*d^3 - 271*a^3*b
*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*
d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*a*b^3*d^4*x^3 + 15
0*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^4*d^4*x^4 + 4*a*b^
3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a))*log(
d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*b^3*c^2*d^2*g^5 -
4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*b^8*c^3*d*g^5 + 6*
a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g^5)*x^4 + 4*(a*b^8
*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 - 4*a^4*b^5*c*d^3*g^
5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6*c^3*d*g^5 + 6*a^4
*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)*x^2 + 4*(a^3*b^6*
c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4*a^6*b^3*c*d^3*g^5
 + a^7*b^2*d^4*g^5)*x))*B^2*c^3 + 1/288*I*(12*((7*a*b^3*c^3 - 33*a^2*b^2*c^
2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4
*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*
c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a
^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^
3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a
^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*
a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6
*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*
c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^
5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*
```

```
b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5))*log(b*x*e/(d*x + c) + a*
e/(d*x + c)) + (37*a*b^4*c^4 - 304*a^2*b^3*c^3*d + 1512*a^3*b^2*c^2*d^2 - 1
360*a^4*b*c*d^3 + 115*a^5*d^4 + 12*(88*b^5*c^2*d^2 - 101*a*b^4*c*d^3 + 13*a
^2*b^3*d^4)*x^3 - 6*(40*b^5*c^3*d - 609*a*b^4*c^2*d^2 + 648*a^2*b^3*c*d^3 -
 79*a^3*b^2*d^4)*x^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d
^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^
2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(b*x + a)^2 - 72*(4*a^4*
b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*
b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 -
 a^4*b*d^4)*x)*log(d*x + c)^2 + 4*(16*b^5*c^4 - 163*a*b^4*c^3*d + 1068*a^2*
b^3*c^2*d^2 - 1036*a^3*b^2*c*d^3 + 115*a^4*b*d^4)*x + 12*(88*a^4*b*c*d^3 -
13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 - 13*a^2
*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^3*b^2*c
*d^3 - 13*a^4*b*d^4)*x)*log(b*x + a) - 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (8
8*b^5*c*d^3 - 13*a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 +
 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b
*d^4)*x - 12*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(
4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 +
4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(b*x + a))*log(d*x + c))/(a^4*b^6*c^4
*g^5 - 4*a^5*b^5*c^3*d*g^5 + 6*a^6*b^4*c^2*d^2*g^5 - 4*a^7*b^3*c*d^3*g^5 +
a^8*b^2*d^4*g^5 + (b^10*c^4*g^5 - 4*a*b^9*c^3*d*g^5 + 6*a^2*b^8*c^2*d^2*g^5
 - 4*a^3*b^7*c*d^3*g^5 + a^4*b^6*d^4*g^5)*x^4 +...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 537 vs. $2(134) = 268$.
time = 0.41, size = 537, normalized size = 3.65

$$-\frac{(-8i A^2 - 4i AB - i B^2)b^4c^4 + (8i A^2 + 4i AB + i B^2)a^4d^4 - 4\left((8i A^2 + 4i AB + i B^2)b^4cd^3 + (-8i A^2 - 4i AB - i B^2)ab^3d^4\right)x^3 - 6\left((8i A^2 + 4i AB + i B^2)b^4c^2d^2 + (-8i A^2 - 4i AB - i B^2)a^2b^2d^4\right)x^2 - 8\left(i B^2b^4d^4x^4 + 4i B^2b^4cd^3x^3 + 6i B^2b^4c^2d^2x^2 + 4i B^2b^4c^3dx + i B^2b^4c^4\right)\log\left(\frac{(bx+a)e}{dx+c}\right)^2 - 4\left((8i A^2 + 4i AB + i B^2)b^4c^3d + (-8i A^2 - 4i AB - i B^2)a^3bd^4\right)x - 4\left((4i AB + i B^2)b^4d^4x^4 + 4(4i AB + i B^2)b^4cd^3x^3 + 6(4i AB + i B^2)b^4c^2d^2x^2 + 4(4i AB + i B^2)b^4c^3dx + (4i AB + i B^2)b^4c^4\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{32\left((b^9c - ab^8d)g^5x^4 + 4(ab^8c - a^2b^7d)g^5x^3 + 6(a^2b^7c - a^3b^6d)g^5x^2 + 4(a^3b^6c - a^4b^5d)g^5x + (a^4b^5c - a^5b^4d)g^5\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="fricas")
```

```
[Out] -1/32*((-8*I*A^2 - 4*I*A*B - I*B^2)*b^4*c^4 + (8*I*A^2 + 4*I*A*B + I*B^2)*a
^4*d^4 - 4*((8*I*A^2 + 4*I*A*B + I*B^2)*b^4*c*d^3 + (-8*I*A^2 - 4*I*A*B - I
*B^2)*a*b^3*d^4)*x^3 - 6*((8*I*A^2 + 4*I*A*B + I*B^2)*b^4*c^2*d^2 + (-8*I*A
^2 - 4*I*A*B - I*B^2)*a^2*b^2*d^4)*x^2 - 8*(I*B^2*b^4*d^4*x^4 + 4*I*B^2*b^4
*c*d^3*x^3 + 6*I*B^2*b^4*c^2*d^2*x^2 + 4*I*B^2*b^4*c^3*d*x + I*B^2*b^4*c^4)
*log((b*x + a)*e/(d*x + c))^2 - 4*((8*I*A^2 + 4*I*A*B + I*B^2)*b^4*c^3*d +
(-8*I*A^2 - 4*I*A*B - I*B^2)*a^3*b*d^4)*x - 4*((4*I*A*B + I*B^2)*b^4*d^4*x^
4 + 4*(4*I*A*B + I*B^2)*b^4*c*d^3*x^3 + 6*(4*I*A*B + I*B^2)*b^4*c^2*d^2*x^2
 + 4*(4*I*A*B + I*B^2)*b^4*c^3*d*x + (4*I*A*B + I*B^2)*b^4*c^4)*log((b*x +
a)*e/(d*x + c)))/((b^9*c - a*b^8*d)*g^5*x^4 + 4*(a*b^8*c - a^2*b^7*d)*g^5*x
^3 + 6*(a^2*b^7*c - a^3*b^6*d)*g^5*x^2 + 4*(a^3*b^6*c - a^4*b^5*d)*g^5*x +
(a^4*b^5*c - a^5*b^4*d)*g^5)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.98, size = 180, normalized size = 1.22

$$\frac{\left(8i\,B^2e^5\log\left(\frac{bxe+ae}{dx+c}\right)^2+16i\,ABe^5\log\left(\frac{bxe+ae}{dx+c}\right)+4i\,B^2e^5\log\left(\frac{bxe+ae}{dx+c}\right)+8i\,A^2e^5+4i\,ABe^5+i\,B^2e^5\right)(dx+c)^4\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{32\,(bxe+ae)^4g^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="giac")
```

```
[Out] 1/32*(8*I*B^2*e^5*log((b*x*e + a*e)/(d*x + c))^2 + 16*I*A*B*e^5*log((b*x*e
+ a*e)/(d*x + c)) + 4*I*B^2*e^5*log((b*x*e + a*e)/(d*x + c)) + 8*I*A^2*e^5
+ 4*I*A*B*e^5 + I*B^2*e^5)*(d*x + c)^4*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) -
 a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^4*g^5)
```

Mupad [B]
time = 10.43, size = 1565, normalized size = 10.65

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
5,x)
```

```
[Out] -(24*A^2*a^4*d^4*i^3 - 24*A^2*b^4*c^4*i^3 + 3*B^2*a^4*d^4*i^3 - 3*B^2*b^4*c
^4*i^3 + 12*A*B*a^4*d^4*i^3 - 12*A*B*b^4*c^4*i^3 - 24*B^2*b^4*c^4*i^3*log((
e*(a + b*x))/(c + d*x))^2 + B^2*a^4*d^4*i^3*atan((a*d*1i + b*c*1i + b*d*x*2
i)/(a*d - b*c))*24i + 12*B^2*a^4*d^4*i^3*log((e*(a + b*x))/(c + d*x)) - 12*
B^2*b^4*c^4*i^3*log((e*(a + b*x))/(c + d*x)) - 24*B^2*b^4*d^4*i^3*x^4*log((
e*(a + b*x))/(c + d*x))^2 + 96*A^2*a^3*b*d^4*i^3*x + 12*B^2*a^3*b*d^4*i^3*x
 - 96*A^2*b^4*c^3*d*i^3*x - 12*B^2*b^4*c^3*d*i^3*x + B^2*b^4*d^4*i^3*x^4*at
an((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*24i + A*B*a^4*d^4*i^3*atan((a*
d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*96i + 96*A^2*a*b^3*d^4*i^3*x^3 + 12*
B^2*a*b^3*d^4*i^3*x^3 - 96*A^2*b^4*c*d^3*i^3*x^3 - 12*B^2*b^4*c*d^3*i^3*x^3
 + 48*A*B*a^4*d^4*i^3*log((e*(a + b*x))/(c + d*x)) - 48*A*B*b^4*c^4*i^3*log
((e*(a + b*x))/(c + d*x)) + 144*A^2*a^2*b^2*d^4*i^3*x^2 + 18*B^2*a^2*b^2*d^
```

4*i^3*x^2 - 144*A^2*b^4*c^2*d^2*i^3*x^2 - 18*B^2*b^4*c^2*d^2*i^3*x^2 + 48*A*B*a^3*b*d^4*i^3*x - 48*A*B*b^4*c^3*d*i^3*x + 48*B^2*a*b^3*d^4*i^3*x^3*log((e*(a + b*x))/(c + d*x)) - 96*B^2*b^4*c^3*d*i^3*x*log((e*(a + b*x))/(c + d*x))^2 - 48*B^2*b^4*c*d^3*i^3*x^3*log((e*(a + b*x))/(c + d*x)) + A*B*b^4*d^4*i^3*x^4*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*96i + B^2*a^3*b*d^4*i^3*x*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*96i + 48*A*B*a*b^3*d^4*i^3*x^3 - 48*A*B*b^4*c*d^3*i^3*x^3 + 72*B^2*a^2*b^2*d^4*i^3*x^2*log((e*(a + b*x))/(c + d*x)) - 72*B^2*b^4*c^2*d^2*i^3*x^2*log((e*(a + b*x))/(c + d*x)) - 96*B^2*b^4*c*d^3*i^3*x^3*log((e*(a + b*x))/(c + d*x))^2 + B^2*a*b^3*d^4*i^3*x^3*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*96i + 48*B^2*a^3*b*d^4*i^3*x*log((e*(a + b*x))/(c + d*x)) - 48*B^2*b^4*c^3*d*i^3*x*log((e*(a + b*x))/(c + d*x)) + 72*A*B*a^2*b^2*d^4*i^3*x^2 - 72*A*B*b^4*c^2*d^2*i^3*x^2 - 144*B^2*b^4*c^2*d^2*i^3*x^2*log((e*(a + b*x))/(c + d*x))^2 + B^2*a^2*b^2*d^4*i^3*x^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*144i + A*B*a^3*b*d^4*i^3*x*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*384i + 288*A*B*a^2*b^2*d^4*i^3*x^2*log((e*(a + b*x))/(c + d*x)) - 288*A*B*b^4*c^2*d^2*i^3*x^2*log((e*(a + b*x))/(c + d*x)) + A*B*a*b^3*d^4*i^3*x^3*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*384i + 192*A*B*a^3*b*d^4*i^3*x*log((e*(a + b*x))/(c + d*x)) - 192*A*B*b^4*c^3*d*i^3*x*log((e*(a + b*x))/(c + d*x)) + A*B*a^2*b^2*d^4*i^3*x^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*576i + 192*A*B*a*b^3*d^4*i^3*x^3*log((e*(a + b*x))/(c + d*x)) - 192*A*B*b^4*c*d^3*i^3*x^3*log((e*(a + b*x))/(c + d*x)))/(96*b^4*g^5*(a*d - b*c)*(a + b*x)^4)

3.82 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=299

$$\frac{B^2di^3(c+dx)^4}{32(bc-ad)^2g^6(a+bx)^4}-\frac{2bB^2i^3(c+dx)^5}{125(bc-ad)^2g^6(a+bx)^5}+\frac{Bdi^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8(bc-ad)^2g^6(a+bx)^4}-\frac{2bBi^3(c+dx)^5}{25(bc-}$$

```
[Out] 1/32*B^2*d*i^3*(d*x+c)^4/(-a*d+b*c)^2/g^6/(b*x+a)^4-2/125*b*B^2*i^3*(d*x+c)
^5/(-a*d+b*c)^2/g^6/(b*x+a)^5+1/8*B*d*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+
c)))/(-a*d+b*c)^2/g^6/(b*x+a)^4-2/25*b*B*i^3*(d*x+c)^5*(A+B*ln(e*(b*x+a)/(d
*x+c)))/(-a*d+b*c)^2/g^6/(b*x+a)^5+1/4*d*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d
*x+c)))^2/(-a*d+b*c)^2/g^6/(b*x+a)^4-1/5*b*i^3*(d*x+c)^5*(A+B*ln(e*(b*x+a)/
(d*x+c)))^2/(-a*d+b*c)^2/g^6/(b*x+a)^5
```

Rubi [A]
time = 0.20, antiderivative size = 299, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2562, 2395, 2342, 2341}

$$-\frac{bi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{5g^6(a+bx)^5(bc-ad)^2}-\frac{2bBi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{25g^6(a+bx)^5(bc-ad)^2}+\frac{di^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^6(a+bx)^4(bc-ad)^2}+\frac{Bdi^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^6(a+bx)^4(bc-ad)^2}-\frac{2bB^2i^3(c+dx)^5}{125g^6(a+bx)^5(bc-ad)^2}+\frac{B^2di^3(c+dx)^4}{32g^6(a+bx)^4(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
6,x]
```

```
[Out] (B^2*d*i^3*(c + d*x)^4)/(32*(b*c - a*d)^2*g^6*(a + b*x)^4) - (2*b*B^2*i^3*(
c + d*x)^5)/(125*(b*c - a*d)^2*g^6*(a + b*x)^5) + (B*d*i^3*(c + d*x)^4*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)^2*g^6*(a + b*x)^4) - (2*b*
B*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(25*(b*c - a*d)^2*g
^6*(a + b*x)^5) + (d*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2
)/(4*(b*c - a*d)^2*g^6*(a + b*x)^4) - (b*i^3*(c + d*x)^5*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(5*(b*c - a*d)^2*g^6*(a + b*x)^5)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(82c+82dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx = \int \left(\frac{551368(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^6(a+bx)^6} + \frac{1654104d(b$$

$$= \frac{(551368d^3)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^3}\,dx}{b^3g^6} + \frac{(1654104d^2(bc-ad))\int}{b^3g^{}}$$

$$= -\frac{551368(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^4g^6(a+bx)^5} - \frac{413526d(bc-}{}$$

$$= -\frac{551368(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^4g^6(a+bx)^5} - \frac{413526d(bc-}{}$$

$$= -\frac{551368(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^4g^6(a+bx)^5} - \frac{413526d(bc-}{}$$

$$= -\frac{551368(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^4g^6(a+bx)^5} - \frac{413526d(bc-}{}$$

$$= -\frac{1102736B(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^4g^6(a+bx)^5} - \frac{758131Bd(b}{}$$

$$= -\frac{1102736B(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^4g^6(a+bx)^5} - \frac{758131Bd(b}{}$$

$$= -\frac{1102736B(bc-ad)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^4g^6(a+bx)^5} - \frac{758131Bd(b}{}$$

$$= -\frac{1102736B^2(bc-ad)^3}{125b^4g^6(a+bx)^5} - \frac{2687919B^2d(bc-ad)^2}{100b^4g^6(a+bx)^4} - \frac{482447B}{25b^4g}$$

$$= -\frac{1102736B^2(bc-ad)^3}{125b^4g^6(a+bx)^5} - \frac{2687919B^2d(bc-ad)^2}{100b^4g^6(a+bx)^4} - \frac{482447B}{25b^4g}$$

$$= -\frac{1102736B^2(bc-ad)^3}{125b^4g^6(a+bx)^5} - \frac{2687919B^2d(bc-ad)^2}{100b^4g^6(a+bx)^4} - \frac{482447B}{25b^4g}$$

$$= -\frac{1102736B^2(bc-ad)^3}{125b^4g^6(a+bx)^5} - \frac{2687919B^2d(bc-ad)^2}{100b^4g^6(a+bx)^4} - \frac{482447B}{25b^4g}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order

3 in optimal.
time = 2.90, size = 2289, normalized size = 7.66

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^6,x]
```

```
[Out] (i^3*(2000*a^2*B^2*d^2*(b*c - a*d)^3 - 825*a*B^2*d*(b*c - a*d)^4 - 192*B^2*
(b*c - a*d)^5 + 4000*a*b*B^2*d^2*(b*c - a*d)^3*x - 825*b*B^2*d*(b*c - a*d)^
4*x + 2000*b^2*B^2*d^2*(b*c - a*d)^3*x^2 - 3000*a^2*B^2*d^3*(b*c - a*d)^2*(
a + b*x) + 1100*a*B^2*d^2*(b*c - a*d)^3*(a + b*x) + 240*B^2*d*(b*c - a*d)^4
*(a + b*x) - 6000*a*b*B^2*d^3*(b*c - a*d)^2*x*(a + b*x) + 1100*b*B^2*d^2*(b
*c - a*d)^3*x*(a + b*x) - 3000*b^2*B^2*d^3*(b*c - a*d)^2*x^2*(a + b*x) + 60
00*a^2*B^2*d^4*(b*c - a*d)*(a + b*x)^2 - 6150*a*B^2*d^3*(b*c - a*d)^2*(a +
b*x)^2 + 3520*B^2*d^2*(-(b*c) + a*d)^3*(a + b*x)^2 + 12000*a*b*B^2*d^4*(b*c
 - a*d)*x*(a + b*x)^2 - 6150*b*B^2*d^3*(b*c - a*d)^2*x*(a + b*x)^2 + 6000*b
^2*B^2*d^4*(b*c - a*d)*x^2*(a + b*x)^2 + 18000*a*b*B^2*c*d^4*(a + b*x)^3 -
18000*a^2*B^2*d^5*(a + b*x)^3 + 12300*a*B^2*d^4*(b*c - a*d)*(a + b*x)^3 + 9
480*B^2*d^3*(b*c - a*d)^2*(a + b*x)^3 + 18000*b^2*B^2*c*d^4*x*(a + b*x)^3 -
 18000*a*b*B^2*d^5*x*(a + b*x)^3 + 12300*b*B^2*d^4*(b*c - a*d)*x*(a + b*x)^
3 - 16800*b*B^2*c*d^4*(a + b*x)^4 + 16800*a*B^2*d^5*(a + b*x)^4 + 18960*B^2
*d^4*(-(b*c) + a*d)*(a + b*x)^4 + 6000*a^2*B^2*d^5*(a + b*x)^3*Log[a + b*x]
 + 12000*a*b*B^2*d^5*x*(a + b*x)^3*Log[a + b*x] + 6000*b^2*B^2*d^5*x^2*(a +
 b*x)^3*Log[a + b*x] + 30300*a*B^2*d^5*(a + b*x)^4*Log[a + b*x] + 30300*b*B
^2*d^5*x*(a + b*x)^4*Log[a + b*x] - 35760*B^2*d^5*(a + b*x)^5*Log[a + b*x]
- 4500*a*B*d*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 960*B*(b*
c - a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4500*b*B*d*(b*c - a*d)^4*
x*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6000*a*B*d^2*(b*c - a*d)^3*(a + b*
x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 1200*B*d*(b*c - a*d)^4*(a + b*x)*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6000*b*B*d^2*(b*c - a*d)^3*x*(a + b*
x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 9000*a*B*d^3*(b*c - a*d)^2*(a + b
*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 9600*B*d^2*(-(b*c) + a*d)^3*(a
 + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 9000*b*B*d^3*(b*c - a*d)^2
*x*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 18000*a*B*d^4*(b*c -
a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 8400*B*d^3*(b*c - a
*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 18000*b*B*d^4*(b*c
 - a*d)*x*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 16800*B*d^4*(-
(b*c) + a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 18000*a*B*d
^5*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 18000*b*
B*d^5*x*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 168
00*B*d^5*(a + b*x)^5*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24
00*(b*c - a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 9000*d*(b*c - a*d
)^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 12000*d^2*(-(b*c) +
```

```
a*d)^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 6000*d^3*(b*c -
 a*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 6000*a^2*B^2*d
^5*(a + b*x)^3*Log[c + d*x] - 12000*a*b*B^2*d^5*x*(a + b*x)^3*Log[c + d*x]
- 6000*b^2*B^2*d^5*x^2*(a + b*x)^3*Log[c + d*x] - 30300*a*B^2*d^5*(a + b*x)
^4*Log[c + d*x] - 30300*b*B^2*d^5*x*(a + b*x)^4*Log[c + d*x] + 35760*B^2*d^
5*(a + b*x)^5*Log[c + d*x] - 18000*a*B*d^5*(a + b*x)^4*(A + B*Log[(e*(a + b
*x))/(c + d*x)])*Log[c + d*x] - 18000*b*B*d^5*x*(a + b*x)^4*(A + B*Log[(e*(
a + b*x))/(c + d*x)])*Log[c + d*x] + 16800*B*d^5*(a + b*x)^5*(A + B*Log[(e*
(a + b*x))/(c + d*x)])*Log[c + d*x] - 9000*a*B^2*d^5*(a + b*x)^4*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) - 9000*b*B^2*d^5*x*(a + b*x)^4*(Log[a + b*x]*(Log[
a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)]) + 8400*B^2*d^5*(a + b*x)^5*(Log[a + b*x]*(Log[a + b*x] - 2*
Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)
]) + 9000*a*B^2*d^5*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 9000*b
*B^2*d^5*x*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x]
)*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 8400*B^2*d^5*(a
 + b*x)^5*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(12000*b^4*(b*c - a*d)^2*g^6
*(a + b*x)^5)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 721 vs. $2(287) = 574$.

time = 0.94, size = 722, normalized size = 2.41

method	result
derivativedivides	$-\frac{e(ad-cb)\left(\frac{i^3d^2e^4A^2b}{5(ad-cb)^3g^6\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^5}-\frac{i^3d^3e^3A^2}{4(ad-cb)^3g^6\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^4}-\frac{2i^3d^2e^4ABb\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{5\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^5}-\cdots\right.}{(ad-cb)^3g^6}\cdots\right.}{\cdots}$
default	$-\frac{e(ad-cb)\left(\frac{i^3d^2e^4A^2b}{5(ad-cb)^3g^6\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^5}-\frac{i^3d^3e^3A^2}{4(ad-cb)^3g^6\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^4}-\frac{2i^3d^2e^4ABb\left(-\frac{\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{5\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^5}-\cdots\right.}{(ad-cb)^3g^6}\cdots\right.}{\cdots}$
norman	Expression too large to display
risch	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/5*i^3*d^2*e^4/(a*d-b*c)^3/g^6*A^2*b/(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^5-1/4*i^3*d^3*e^3/(a*d-b*c)^3/g^6*A^2/(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^4-2*i^3*d^2*e^4/(a*d-b*c)^3/g^6*A*B*b*(-1/5/(b*e/d+(a*d-b*c)*e/d/(d*x
+c))^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/25/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5
)+2*i^3*d^3*e^3/(a*d-b*c)^3/g^6*A*B*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/16/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4)-i^3*d^
2*e^4/(a*d-b*c)^3/g^6*B^2*b*(-1/5/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))^2-2/25/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))-2/125/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5)+i^3*d^3*e^3/(a*d-
b*c)^3/g^6*B^2*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))^2-1/8/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))-1/32/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 15741 vs. $2(273) = 546$.
time = 2.27, size = 15741, normalized size = 52.65

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="maxima")
```

```
[Out] 3/20*I*(5*b*x + a)*B^2*c^2*d*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^7*g^
6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b
^3*g^6*x + a^5*b^2*g^6) + 1/10*I*(10*b^2*x^2 + 5*a*b*x + a^2)*B^2*c*d^2*log
(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2
*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + 1/20*I
*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*x + a^3)*B^2*d^3*log(b*x*e/(d*x + c)
+ a*e/(d*x + c))^2/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g^6*x^3 + 10
*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) + 1/9000*I*(60*((60*b^4*d
^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^
3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13
*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43
*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^
2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c
^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2
*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*
d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^
6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a
^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^
6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*d^
5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*
c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5
 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^
```

4 - a^5*b*d^5)*g^6))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + (144*b^5*c^5 - 1125*a*b^4*c^4*d + 4000*a^2*b^3*c^3*d^2 - 9000*a^3*b^2*c^2*d^3 + 18000*a^4*b*c*d^4 - 12019*a^5*d^5 + 8220*(b^5*c*d^4 - a*b^4*d^5)*x^4 - 30*(77*b^5*c^2*d^3 - 1250*a*b^4*c*d^4 + 1173*a^2*b^3*d^5)*x^3 + 10*(94*b^5*c^3*d^2 - 975*a*b^4*c^2*d^3 + 6600*a^2*b^3*c*d^4 - 5719*a^3*b^2*d^5)*x^2 - 1800*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b*x + a)^2 - 1800*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(d*x + c)^2 - 5*(81*b^5*c^4*d - 700*a*b^4*c^3*d^2 + 3000*a^2*b^3*c^2*d^3 - 10800*a^3*b^2*c*d^4 + 8419*a^4*b*d^5)*x + 8220*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b*x + a) - 60*(137*b^5*d^5*x^5 + 685*a*b^4*d^5*x^4 + 1370*a^2*b^3*d^5*x^3 + 1370*a^3*b^2*d^5*x^2 + 685*a^4*b*d^5*x + 137*a^5*d^5 - 60*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b*x + a))*log(d*x + c))/(a^5*b^6*c^5*g^6 - 5*a^6*b^5*c^4*d*g^6 + 10*a^7*b^4*c^3*d^2*g^6 - 10*a^8*b^3*c^2*d^3*g^6 + 5*a^9*b^2*c*d^4*g^6 - a^10*b*d^5*g^6 + (b^11*c^5*g^6 - 5*a*b^10*c^4*d*g^6 + 10*a^2*b^9*c^3*d^2*g^6 - 10*a^3*b^8*c^2*d^3*g^6 + 5*a^4*b^7*c*d^4*g^6 - a^5*b^6*d^5*g^6)*x^5 + 5*(a*b^10*c^5*g^6 - 5*a^2*b^9*c^4*d*g^6 + 10*a^3*b^8*c^3*d^2*g^6 - 10*a^4*b^7*c^2*d^3*g^6 + 5*a^5*b^6*c*d^4*g^6 - a^6*b^5*d^5*g^6)*x^4 + 10*(a^2*b^9*c^5*g^6 - 5*a^3*b^8*c^4*d*g^6 + 10*a^4*b^7*c^3*d^2*g^6 - 10*a^5*b^6*c^2*d^3*g^6 + 5*a^6*b^5*c*d^4*g^6 - a^7*b^4*d^5*g^6)*x^3 + 10*(a^3*b^8*c^5*g^6 - 5*a^4*b^7*c^4*d*g^6 + 10*a^5*b^6*c^3*d^2*g^6 - 10*a^6*b^5*c^2*d^3*g^6 + 5*a^7*b^4*c*d^4*g^6 - a^8*b^3*d^5*g^6)*x^2 + 5*(a^4*b^7*c^5*g^6 - 5*a^5*b^6*c^4*d*g^6 + 10*a^6*b^5*c^3*d^2*g^6 - 10*a^7*b^4*c^2*d^3*g^6 + 5*a^8*b^3*c*d^4*g^6 - a^9*b^2*d^5*g^6)*x))*B^2*c^3 + 1/12000*I*(60*((27*a*b^4*c^4 - 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + (549*a*b^5*c^5 - 4625*a^2*b^4*c^4*d + 19000*a^3*b^3*c^3*d^2 - 63000*a^4*b^2*c^2*d^3 + 51875*a^5*b*c*d^4 - 3799*a^6*d^5 - 60*(625*b^6*c^2*d^3 - 702*a*b^5*c*d^4 + 77*a^2*b^4*d^5)*x^4 + 30...

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1007 vs. $2(273) = 546$.
time = 0.43, size = 1007, normalized size = 3.37

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="fricas")
```

```
[Out] -1/4000*(32*(-25*I*A^2 - 10*I*A*B - 2*I*B^2)*b^5*c^5 + 125*(8*I*A^2 + 4*I*A
*B + I*B^2)*a*b^4*c^4*d - (200*I*A^2 + 180*I*A*B + 61*I*B^2)*a^5*d^5 + 20*(
(20*I*A*B + 9*I*B^2)*b^5*c*d^4 + (-20*I*A*B - 9*I*B^2)*a*b^4*d^5)*x^4 + 10*
((-200*I*A^2 - 20*I*A*B + 11*I*B^2)*b^5*c^2*d^3 + 50*(8*I*A^2 + 4*I*A*B + I
*B^2)*a*b^4*c*d^4 + (-200*I*A^2 - 180*I*A*B - 61*I*B^2)*a^2*b^3*d^5)*x^3 +
10*(2*(-200*I*A^2 - 60*I*A*B - 7*I*B^2)*b^5*c^3*d^2 + 75*(8*I*A^2 + 4*I*A*B
 + I*B^2)*a*b^4*c^2*d^3 + (-200*I*A^2 - 180*I*A*B - 61*I*B^2)*a^3*b^2*d^5)*
x^2 + 200*(I*B^2*b^5*d^5*x^5 + 5*I*B^2*a*b^4*d^5*x^4 - 4*I*B^2*b^5*c^5 + 5*
I*B^2*a*b^4*c^4*d + 10*(-I*B^2*b^5*c^2*d^3 + 2*I*B^2*a*b^4*c*d^4)*x^3 + 10*
(-2*I*B^2*b^5*c^3*d^2 + 3*I*B^2*a*b^4*c^2*d^3)*x^2 + 5*(-3*I*B^2*b^5*c^4*d
+ 4*I*B^2*a*b^4*c^3*d^2)*x)*log((b*x + a)*e/(d*x + c))^2 + 5*((-600*I*A^2 -
 220*I*A*B - 39*I*B^2)*b^5*c^4*d + 100*(8*I*A^2 + 4*I*A*B + I*B^2)*a*b^4*c^
3*d^2 + (-200*I*A^2 - 180*I*A*B - 61*I*B^2)*a^4*b*d^5)*x + 20*((20*I*A*B +
9*I*B^2)*b^5*d^5*x^5 + 16*(-5*I*A*B - I*B^2)*b^5*c^5 + 25*(4*I*A*B + I*B^2)
*a*b^4*c^4*d + 5*(4*I*B^2*b^5*c*d^4 + 5*(4*I*A*B + I*B^2)*a*b^4*d^5)*x^4 +
10*((-20*I*A*B - I*B^2)*b^5*c^2*d^3 + 10*(4*I*A*B + I*B^2)*a*b^4*c*d^4)*x^3
 + 10*(2*(-20*I*A*B - 3*I*B^2)*b^5*c^3*d^2 + 15*(4*I*A*B + I*B^2)*a*b^4*c^2
*d^3)*x^2 + 5*((-60*I*A*B - 11*I*B^2)*b^5*c^4*d + 20*(4*I*A*B + I*B^2)*a*b^
4*c^3*d^2)*x)*log((b*x + a)*e/(d*x + c)))/((b^11*c^2 - 2*a*b^10*c*d + a^2*b
^9*d^2)*g^6*x^5 + 5*(a*b^10*c^2 - 2*a^2*b^9*c*d + a^3*b^8*d^2)*g^6*x^4 + 10
*(a^2*b^9*c^2 - 2*a^3*b^8*c*d + a^4*b^7*d^2)*g^6*x^3 + 10*(a^3*b^8*c^2 - 2*
a^4*b^7*c*d + a^5*b^6*d^2)*g^6*x^2 + 5*(a^4*b^7*c^2 - 2*a^5*b^6*c*d + a^6*b
^5*d^2)*g^6*x + (a^5*b^6*c^2 - 2*a^6*b^5*c*d + a^7*b^4*d^2)*g^6)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

Giac [A]
time = 4.34, size = 425, normalized size = 1.42

$$-\frac{\left(-800i\,B^2be^6\log\left(\frac{bxe+ae}{dx+c}\right)^2+\frac{1000i\,(bxe+ae)B^2de^5\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}-1600i\,ABbe^6\log\left(\frac{bxe+ae}{dx+c}\right)-320i\,B^2be^6\log\left(\frac{bxe+ae}{dx+c}\right)+\frac{2000i\,(bxe+ae)ABde^5\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{500i\,(bxe+ae)B^2de^5\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-800i\,A^2be^6-320i\,ABbe^6-64i\,B^2be^6+\frac{1000i\,(bxe+ae)A^2de^5}{dx+c}+\frac{500i\,(bxe+ae)ABde^5}{dx+c}+\frac{125i\,(bxe+ae)B^2de^5}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{4000\left(\frac{(bxe+ae)^5bcg^6}{(dx+c)^5}-\frac{(bxe+ae)^5adg^6}{(dx+c)^5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="giac")
```

```
[Out] -1/4000*(-800*I*B^2*b*e^6*log((b*x*e + a*e)/(d*x + c))^2 + 1000*I*(b*x*e +
a*e)*B^2*d*e^5*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) - 1600*I*A*B*b*e^6*
log((b*x*e + a*e)/(d*x + c)) - 320*I*B^2*b*e^6*log((b*x*e + a*e)/(d*x + c))
 + 2000*I*(b*x*e + a*e)*A*B*d*e^5*log((b*x*e + a*e)/(d*x + c))/(d*x + c) +
500*I*(b*x*e + a*e)*B^2*d*e^5*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 800*
I*A^2*b*e^6 - 320*I*A*B*b*e^6 - 64*I*B^2*b*e^6 + 1000*I*(b*x*e + a*e)*A^2*d
*e^5/(d*x + c) + 500*I*(b*x*e + a*e)*A*B*d*e^5/(d*x + c) + 125*I*(b*x*e + a
*e)*B^2*d*e^5/(d*x + c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e -
 a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^5*b*c*g^6/(d*x + c)^5 - (b*x*e + a*e)^
5*a*d*g^6/(d*x + c)^5)
```

Mupad [**B**]
time = 12.64, size = 2500, normalized size = 8.36

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
6,x)
```

```
[Out] - log((e*(a + b*x))/(c + d*x))^2*((x*(a*(b*((B^2*a*d^3*i^3)/(20*b^5*g^6) +
(B^2*c*d^2*i^3)/(10*b^4*g^6)) + (3*B^2*a*d^3*i^3)/(20*b^4*g^6) + (3*B^2*c*d
^2*i^3)/(10*b^3*g^6)) + b*(a*((B^2*a*d^3*i^3)/(20*b^5*g^6) + (B^2*c*d^2*i^3
)/(10*b^4*g^6)) + (3*B^2*c^2*d*i^3)/(20*b^3*g^6)) + (3*B^2*c^2*d*i^3)/(5*b^
2*g^6)) + x^2*(b*(b*((B^2*a*d^3*i^3)/(20*b^5*g^6) + (B^2*c*d^2*i^3)/(10*b^4
*g^6)) + (3*B^2*a*d^3*i^3)/(20*b^4*g^6) + (3*B^2*c*d^2*i^3)/(10*b^3*g^6)) +
 (3*B^2*a*d^3*i^3)/(10*b^3*g^6) + (3*B^2*c*d^2*i^3)/(5*b^2*g^6)) + a*(a*((B
^2*a*d^3*i^3)/(20*b^5*g^6) + (B^2*c*d^2*i^3)/(10*b^4*g^6)) + (3*B^2*c^2*d*i
^3)/(20*b^3*g^6)) + (B^2*c^3*i^3)/(5*b^2*g^6) + (B^2*d^3*i^3*x^3)/(2*b^2*g^
6))/(5*a^4*x + a^5/b + b^4*x^5 + 10*a^3*b*x^2 + 5*a*b^3*x^4 + 10*a^2*b^2*x^
3) - (B^2*d^5*i^3)/(20*b^4*g^6*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - ((200*A^
2*a^4*d^4*i^3 - 800*A^2*b^4*c^4*i^3 + 61*B^2*a^4*d^4*i^3 - 64*B^2*b^4*c^4*i
^3 + 180*A*B*a^4*d^4*i^3 - 320*A*B*b^4*c^4*i^3 + 200*A^2*a*b^3*c^3*d*i^3 +
200*A^2*a^3*b*c*d^3*i^3 + 61*B^2*a*b^3*c^3*d*i^3 + 61*B^2*a^3*b*c*d^3*i^3 +
 200*A^2*a^2*b^2*c^2*d^2*i^3 + 61*B^2*a^2*b^2*c^2*d^2*i^3 + 180*A*B*a^2*b^2
*c^2*d^2*i^3 + 180*A*B*a*b^3*c^3*d*i^3 + 180*A*B*a^3*b*c*d^3*i^3)/(20*(a*d
- b*c)) + (x^4*(9*B^2*b^4*d^4*i^3 + 20*A*B*b^4*d^4*i^3))/(a*d - b*c) + (x^3
*(200*A^2*a*b^3*d^4*i^3 + 61*B^2*a*b^3*d^4*i^3 - 200*A^2*b^4*c*d^3*i^3 + 11
*B^2*b^4*c*d^3*i^3 + 180*A*B*a*b^3*d^4*i^3 - 20*A*B*b^4*c*d^3*i^3))/(2*(a*d
 - b*c)) + (x*(200*A^2*a^3*b*d^4*i^3 + 61*B^2*a^3*b*d^4*i^3 - 600*A^2*b^4*c
^3*d*i^3 - 39*B^2*b^4*c^3*d*i^3 + 200*A^2*a*b^3*c^2*d^2*i^3 + 200*A^2*a^2*b
```

^2*c*d^3*i^3 + 61*B^2*a*b^3*c^2*d^2*i^3 + 61*B^2*a^2*b^2*c*d^3*i^3 + 180*A*
B*a^3*b*d^4*i^3 - 220*A*B*b^4*c^3*d*i^3 + 180*A*B*a*b^3*c^2*d^2*i^3 + 180*A
*B*a^2*b^2*c*d^3*i^3))/(4*(a*d - b*c)) + (x^2*(200*A^2*a^2*b^2*d^4*i^3 + 61
*B^2*a^2*b^2*d^4*i^3 - 400*A^2*b^4*c^2*d^2*i^3 - 14*B^2*b^4*c^2*d^2*i^3 + 2
00*A^2*a*b^3*c*d^3*i^3 + 61*B^2*a*b^3*c*d^3*i^3 + 180*A*B*a^2*b^2*d^4*i^3 -
 120*A*B*b^4*c^2*d^2*i^3 + 180*A*B*a*b^3*c*d^3*i^3))/(2*(a*d - b*c)))/(200*
a^5*b^4*g^6 + 200*b^9*g^6*x^5 + 1000*a^4*b^5*g^6*x + 1000*a*b^8*g^6*x^4 + 2
000*a^3*b^6*g^6*x^2 + 2000*a^2*b^7*g^6*x^3) - (log((e*(a + b*x))/(c + d*x))
(x^3((A*B*d^2*i^3)/(b^2*g^6) + (B^2*d^5*i^3*((b^4*c^2 + 5*a^2*b^2*d^2 - 6
*a*b^3*c*d)/(5*d^3) + b*(b*(b*((5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(20*b*d^3)
 + (a*(a*d - b*c))/(5*b*d^2)) + (5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(10*d^3)
+ (2*a*(a*d - b*c))/(5*d^2)) - a*((b^2*c - a*b*d)/(5*d^2) - (2*b*(a*d - b*c
))/(5*d^2)) + (3*(b^3*c^2 + 5*a^2*b*d^2 - 6*a*b^2*c*d))/(20*d^3)) - a*(b*((
b^2*c - a*b*d)/(5*d^2) - (2*b*(a*d - b*c))/(5*d^2)) + (b^3*c - a*b^2*d)/(5*
d^2))))/(10*b^4*g^6*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) + a*(a*((B*d*i^3*(6*A
*b*c - B*a*d + B*b*c))/(30*b^5*g^6) + (A*B*a*d^2*i^3)/(10*b^5*g^6)) + (B*i^
3*(6*A*b^2*c^2 - B*a^2*d^2 + B*b^2*c^2))/(20*b^5*g^6)) + x*(b*(a*((B*d*i^3*
(6*A*b*c - B*a*d + B*b*c))/(30*b^5*g^6) + (A*B*a*d^2*i^3)/(10*b^5*g^6)) + (
B*i^3*(6*A*b^2*c^2 - B*a^2*d^2 + B*b^2*c^2))/(20*b^5*g^6)) + a*(b*((B*d*i^3
*(6*A*b*c - B*a*d + B*b*c))/(30*b^5*g^6) + (A*B*a*d^2*i^3)/(10*b^5*g^6)) +
(B*d*i^3*(6*A*b*c - B*a*d + B*b*c))/(10*b^4*g^6) + (3*A*B*a*d^2*i^3)/(10*b^
4*g^6)) + (B*i^3*(6*A*b^2*c^2 - B*a^2*d^2 + B*b^2*c^2))/(5*b^4*g^6) + (B^2*
d^5*i^3*((10*a^4*d^4 + b^4*c^4 + 15*a^2*b^2*c^2*d^2 - 6*a*b^3*c^3*d - 20*a^
3*b*c*d^3)/(5*d^5) + b*(a*(a*((5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(20*b*d^3)
+ (a*(a*d - b*c))/(5*b*d^2)) + (10*a^3*d^3 - b^3*c^3 + 6*a*b^2*c^2*d - 15*a
^2*b*c*d^2)/(30*b*d^4)) + (10*a^4*d^4 + b^4*c^4 + 15*a^2*b^2*c^2*d^2 - 6*a*
b^3*c^3*d - 20*a^3*b*c*d^3)/(20*b*d^5)) + a*(b*(a*((5*a^2*d^2 + b^2*c^2 - 6
*a*b*c*d)/(20*b*d^3) + (a*(a*d - b*c))/(5*b*d^2)) + (10*a^3*d^3 - b^3*c^3 +
 6*a*b^2*c^2*d - 15*a^2*b*c*d^2)/(30*b*d^4)) + a*(b*((5*a^2*d^2 + b^2*c^2 -
 6*a*b*c*d)/(20*b*d^3) + (a*(a*d - b*c))/(5*b*d^2)) + (5*a^2*d^2 + b^2*c^2
- 6*a*b*c*d)/(10*d^3) + (2*a*(a*d - b*c))/(5*d^2)) + (10*a^3*d^3 - b^3*c^3
+ 6*a*b^2*c^2*d - 15*a^2*b*c*d^2)/(10*d^4))))/(10*b^4*g^6*(a^2*d^2 + b^2*c^
2 - 2*a*b*c*d))) + x^2*(b*(b*((B*d*i^3*(6*A*b*c - B*a*d + B*b*c))/(30*b^5*g
^6) + (A*B*a*d^2*i^3)/(10*b^5*g^6)) + (B*d*i^3*(6*A*b*c - B*a*d + B*b*c))/(
10*b^4*g^6) + (3*A*B*a*d^2*i^3)/(10*b^4*g^6)) + (B*d*i^3*(6*A*b*c - B*a*d +
 B*b*c))/(5*b^3*g^6) + (3*A*B*a*d^2*i^3)/(5*b^3*g^6) + (B^2*d^5*i^3*(a*(b*(
b*((5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(20*b*d^3) + (a*(a*d - b*c))/(5*b*d^2)
) + (5*a^2*d^2 + b^2*c^2 - 6*a*b*c*d)/(10*d^3) + (2*a*(a*d - b*c))/(5*d^2))
 - a*((b^2*c - a*b*d)/(5*d^2) - (2*b*(a*d - b*c))/(5*d^2)) + (3*(b^3*c^2 +
5*a^2*b*d^2 - 6*a*b^2*c*d))/(20*d^3)) - (b^4*c^3 - 10*a^3*b*d^3 + 15*a^2*b^
2*c*d^2 - 6*a*b^3*c^2*d)/(5*d^4) + b*(b*(a*((5*a^2*d^2 + b^2*c^2 - 6*a*b*c*
d)/(20*b*d^3) + (a*(a*d - b*c))/(5*b*d^2)) + (10*a^3*d^3 - b^3*c^3 + 6*a*b^
2*c^2*d - 15*a^2*b*c*d^2)/(30*b*d^4)) + a*(b*((5*a^2*d^2 + b^2*c^2 - 6*a*b*
c*d)/(20*b*d^3) + (a*(a*d - b*c))/(5*b*d^2)) + (5*a^2*d^2 + b^2*c^2 - 6*a*b
*c*d)/(10*d^3) + (2*a*(a*d - b*c))/(5*d^2)) + (10*a^3*d^3 - b^3*c^3 + 6*a*b

```
^2*c^2*d - 15*a^2*b*c*d^2)/(10*d^4))))/(10*b^4*...
```

3.83 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^7}\,dx$

Optimal. Leaf size=463

$$-\frac{B^2d^2i^3(c+dx)^4}{32(bc-ad)^3g^7(a+bx)^4}+\frac{4bB^2di^3(c+dx)^5}{125(bc-ad)^3g^7(a+bx)^5}-\frac{b^2B^2i^3(c+dx)^6}{108(bc-ad)^3g^7(a+bx)^6}-\frac{Bd^2i^3(c+dx)^4\left(A+B\right.}{8(bc-ad)^3g^7(a}$$

```
[Out] -1/32*B^2*d^2*i^3*(d*x+c)^4/(-a*d+b*c)^3/g^7/(b*x+a)^4+4/125*b*B^2*d*i^3*(d
*x+c)^5/(-a*d+b*c)^3/g^7/(b*x+a)^5-1/108*b^2*B^2*i^3*(d*x+c)^6/(-a*d+b*c)^3
/g^7/(b*x+a)^6-1/8*B*d^2*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*
c)^3/g^7/(b*x+a)^4+4/25*b*B*d*i^3*(d*x+c)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a
*d+b*c)^3/g^7/(b*x+a)^5-1/18*b^2*B*i^3*(d*x+c)^6*(A+B*ln(e*(b*x+a)/(d*x+c))
)/(-a*d+b*c)^3/g^7/(b*x+a)^6-1/4*d^2*i^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x+c
)))^2/(-a*d+b*c)^3/g^7/(b*x+a)^4+2/5*b*d*i^3*(d*x+c)^5*(A+B*ln(e*(b*x+a)/(d
*x+c)))^2/(-a*d+b*c)^3/g^7/(b*x+a)^5-1/6*b^2*i^3*(d*x+c)^6*(A+B*ln(e*(b*x+a
)/(d*x+c)))^2/(-a*d+b*c)^3/g^7/(b*x+a)^6
```

Rubi [A]
time = 0.27, antiderivative size = 463, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2562, 2395, 2342, 2341}

$$-\frac{b^2i^3(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{6g^7(a+bx)^6(bc-ad)^3}-\frac{b^2Bi^3(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{18g^7(a+bx)^6(bc-ad)^3}-\frac{d^2i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^7(a+bx)^4(bc-ad)^3}-\frac{Bd^2i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^7(a+bx)^4(bc-ad)^3}+\frac{2bdi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{5g^7(a+bx)^5(bc-ad)^3}+\frac{4bBdi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{25g^7(a+bx)^5(bc-ad)^3}-\frac{b^2B^2i^3(c+dx)^6}{108g^7(a+bx)^6(bc-ad)^3}-\frac{B^2d^2i^3(c+dx)^4}{32g^7(a+bx)^4(bc-ad)^3}+\frac{4bB^2di^3(c+dx)^5}{125g^7(a+bx)^5(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
7,x]
```

```
[Out] -1/32*(B^2*d^2*i^3*(c + d*x)^4)/((b*c - a*d)^3*g^7*(a + b*x)^4) + (4*b*B^2*
d*i^3*(c + d*x)^5)/(125*(b*c - a*d)^3*g^7*(a + b*x)^5) - (b^2*B^2*i^3*(c +
d*x)^6)/(108*(b*c - a*d)^3*g^7*(a + b*x)^6) - (B*d^2*i^3*(c + d*x)^4*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)^3*g^7*(a + b*x)^4) + (4*b*B*
d*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(25*(b*c - a*d)^3*g
^7*(a + b*x)^5) - (b^2*B*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(18*(b*c - a*d)^3*g^7*(a + b*x)^6) - (d^2*i^3*(c + d*x)^4*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^2)/(4*(b*c - a*d)^3*g^7*(a + b*x)^4) + (2*b*d*i^3*(
c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*(b*c - a*d)^3*g^7*(a
+ b*x)^5) - (b^2*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(6
*(b*c - a*d)^3*g^7*(a + b*x)^6)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
```

```
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(83c+83dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^7}\,dx = \int\left(\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^7(a+bx)^7}+\frac{1715361d(\right.$$

$$=\frac{(571787d^3)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^4}\,dx}{b^3g^7}+\frac{(1715361d^2(bc-ad))}{b^3}$$

$$=-\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{6b^4g^7(a+bx)^6}-\frac{1715361d(bc}{}$$

$$=-\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{6b^4g^7(a+bx)^6}-\frac{1715361d(bc}{}$$

$$=-\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{6b^4g^7(a+bx)^6}-\frac{1715361d(bc}{}$$

$$=-\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{6b^4g^7(a+bx)^6}-\frac{1715361d(bc}{}$$

$$=-\frac{571787B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{18b^4g^7(a+bx)^6}-\frac{7433231Bd(}{}$$

$$=-\frac{571787B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{18b^4g^7(a+bx)^6}-\frac{7433231Bd(}{}$$

$$=-\frac{571787B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{18b^4g^7(a+bx)^6}-\frac{7433231Bd(}{}$$

$$=-\frac{571787B^2(bc-ad)^3}{108b^4g^7(a+bx)^6}-\frac{30304711B^2d(bc-ad)^2}{2250b^4g^7(a+bx)^5}-\frac{417404}{7200}$$

$$=-\frac{571787B^2(bc-ad)^3}{108b^4g^7(a+bx)^6}-\frac{30304711B^2d(bc-ad)^2}{2250b^4g^7(a+bx)^5}-\frac{417404}{7200}$$

$$=-\frac{571787B^2(bc-ad)^3}{108b^4g^7(a+bx)^6}-\frac{30304711B^2d(bc-ad)^2}{2250b^4g^7(a+bx)^5}-\frac{417404}{7200}$$

$$=-\frac{571787B^2(bc-ad)^3}{108b^4g^7(a+bx)^6}-\frac{30304711B^2d(bc-ad)^2}{2250b^4g^7(a+bx)^5}-\frac{417404}{7200}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order

3 in optimal.
time = 4.47, size = 2583, normalized size = 5.58

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^7,x]
```

```
[Out] (i^3*(8100*a^2*B^2*d^2*(b*c - a*d)^4 - 1000*B^2*(b*c - a*d)^6 + 3744*a*B^2*
d*(-(b*c) + a*d)^5 + 16200*a*b*B^2*d^2*(b*c - a*d)^4*x - 3744*b*B^2*d*(b*c
- a*d)^5*x + 8100*b^2*B^2*d^2*(b*c - a*d)^4*x^2 + 4680*a*B^2*d^2*(b*c - a*d
)^4*(a + b*x) + 1200*B^2*d*(b*c - a*d)^5*(a + b*x) + 10800*a^2*B^2*d^3*(-(b
*c) + a*d)^3*(a + b*x) + 4680*b*B^2*d^2*(b*c - a*d)^4*x*(a + b*x) + 21600*a
*b*B^2*d^3*(-(b*c) + a*d)^3*x*(a + b*x) - 10800*b^2*B^2*d^3*(b*c - a*d)^3*x
^2*(a + b*x) + 16200*a^2*B^2*d^4*(b*c - a*d)^2*(a + b*x)^2 - 13875*B^2*d^2*
(b*c - a*d)^4*(a + b*x)^2 + 20640*a*B^2*d^3*(-(b*c) + a*d)^3*(a + b*x)^2 +
32400*a*b*B^2*d^4*(b*c - a*d)^2*x*(a + b*x)^2 - 20640*b*B^2*d^3*(b*c - a*d)
^3*x*(a + b*x)^2 + 16200*b^2*B^2*d^4*(b*c - a*d)^2*x^2*(a + b*x)^2 + 63360*
a*B^2*d^4*(b*c - a*d)^2*(a + b*x)^3 + 32500*B^2*d^3*(b*c - a*d)^3*(a + b*x)
^3 + 32400*a^2*B^2*d^5*(-(b*c) + a*d)*(a + b*x)^3 + 63360*b*B^2*d^4*(b*c -
a*d)^2*x*(a + b*x)^3 + 64800*a*b*B^2*d^5*(-(b*c) + a*d)*x*(a + b*x)^3 - 324
00*b^2*B^2*d^5*(b*c - a*d)*x^2*(a + b*x)^3 - 129600*a*b*B^2*c*d^5*(a + b*x)
^4 + 129600*a^2*B^2*d^6*(a + b*x)^4 - 80250*B^2*d^4*(b*c - a*d)^2*(a + b*x)
^4 + 126720*a*B^2*d^5*(-(b*c) + a*d)*(a + b*x)^4 - 129600*b^2*B^2*c*d^5*x*(
a + b*x)^4 + 129600*a*b*B^2*d^6*x*(a + b*x)^4 - 126720*b*B^2*d^5*(b*c - a*d
)*x*(a + b*x)^4 + 126000*b*B^2*c*d^5*(a + b*x)^5 - 126000*a*B^2*d^6*(a + b*
x)^5 + 160500*B^2*d^5*(b*c - a*d)*(a + b*x)^5 - 32400*a^2*B^2*d^6*(a + b*x)
^4*Log[a + b*x] - 64800*a*b*B^2*d^6*x*(a + b*x)^4*Log[a + b*x] - 32400*b^2*
B^2*d^6*x^2*(a + b*x)^4*Log[a + b*x] - 256320*a*B^2*d^6*(a + b*x)^5*Log[a +
 b*x] - 256320*b*B^2*d^6*x*(a + b*x)^5*Log[a + b*x] + 286500*B^2*d^6*(a + b
*x)^6*Log[a + b*x] - 6000*B*(b*c - a*d)^6*(A + B*Log[(e*(a + b*x))/(c + d*x
)]) + 25920*a*B*d*(-(b*c) + a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2
5920*b*B*d*(b*c - a*d)^5*x*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 32400*a*B
*d^2*(b*c - a*d)^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 7200*B*
d*(b*c - a*d)^5*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 32400*b*B*
d^2*(b*c - a*d)^4*x*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 49500*
B*d^2*(b*c - a*d)^4*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4320
0*a*B*d^3*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
 - 43200*b*B*d^3*(b*c - a*d)^3*x*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c +
d*x)]) + 64800*a*B*d^4*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(
c + d*x)]) + 42000*B*d^3*(b*c - a*d)^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)]) + 64800*b*B*d^4*(b*c - a*d)^2*x*(a + b*x)^3*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]) - 63000*B*d^4*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]) + 129600*a*B*d^5*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Log
```

```
[(e*(a + b*x))/(c + d*x)]) - 129600*b*B*d^5*(b*c - a*d)*x*(a + b*x)^4*(A +
B*Log[(e*(a + b*x))/(c + d*x)]) + 126000*B*d^5*(b*c - a*d)*(a + b*x)^5*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]) - 129600*a*B*d^6*(a + b*x)^5*Log[a + b*x]*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 129600*b*B*d^6*x*(a + b*x)^5*Log[a +
 b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 126000*B*d^6*(a + b*x)^6*Log[a
 + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18000*(b*c - a*d)^6*(A + B*L
og[(e*(a + b*x))/(c + d*x)])^2 + 64800*d*(-(b*c) + a*d)^5*(a + b*x)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])^2 - 81000*d^2*(b*c - a*d)^4*(a + b*x)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)])^2 + 36000*d^3*(-(b*c) + a*d)^3*(a + b*x)^3*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 32400*a^2*B^2*d^6*(a + b*x)^4*Log[
c + d*x] + 64800*a*b*B^2*d^6*x*(a + b*x)^4*Log[c + d*x] + 32400*b^2*B^2*d^6
*x^2*(a + b*x)^4*Log[c + d*x] + 256320*a*B^2*d^6*(a + b*x)^5*Log[c + d*x] +
 256320*b*B^2*d^6*x*(a + b*x)^5*Log[c + d*x] - 286500*B^2*d^6*(a + b*x)^6*L
og[c + d*x] + 129600*a*B*d^6*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)
])*Log[c + d*x] + 129600*b*B*d^6*x*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])*Log[c + d*x] - 126000*B*d^6*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x] + 64800*a*B^2*d^6*(a + b*x)^5*(Log[a + b*x]*(Log[a
+ b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(
b*c) + a*d)]) + 64800*b*B^2*d^6*x*(a + b*x)^5*(Log[a + b*x]*(Log[a + b*x] -
 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a
*d)]) - 63000*B^2*d^6*(a + b*x)^6*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
 + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 6480
0*a*B^2*d^6*(a + b*x)^5*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x
])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 64800*b*B^2*d^
6*x*(a + b*x)^5*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c
 + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 63000*B^2*d^6*(a + b*x
)^6*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(108000*b^4*(b*c - a*d)^3*g^7*(a +
 b*x)^6)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1081 vs. $2(445) = 890$.
time = 1.04, size = 1082, normalized size = 2.34 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^7,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/6*i^3*d^2*e^5/(a*d-b*c)^4/g^7*A^2*b^2/(b*e/d+(a*d-b*
c)*e/d/(d*x+c))^6+2/5*i^3*d^3*e^4/(a*d-b*c)^4/g^7*A^2*b/(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^5-1/4*i^3*d^4*e^3/(a*d-b*c)^4/g^7*A^2/(b*e/d+(a*d-b*c)*e/d/(d*x+
c))^4+2*i^3*d^2*e^5/(a*d-b*c)^4/g^7*A*B*b^2*(-1/6/(b*e/d+(a*d-b*c)*e/d/(d*x
+c))^6*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/36/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^6
)-4*i^3*d^3*e^4/(a*d-b*c)^4/g^7*A*B*b*(-1/5/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/25/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5)+2*i^
3*d^4*e^3/(a*d-b*c)^4/g^7*A*B*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/
```

```
d+(a*d-b*c)*e/d/(d*x+c))-1/16/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4)+i^3*d^2*e^5/
(a*d-b*c)^4/g^7*B^2*b^2*(-1/6/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^6*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))^2-1/18/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^6*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))-1/108/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^6)-2*i^3*d^3*e^4/(a*d-b*
c)^4/g^7*B^2*b*(-1/5/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))^2-2/25/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))-2/125/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^5)+i^3*d^4*e^3/(a*d-b*c)^4/g^7*B^
2*(-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-1
/8/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/32/(b*
e/d+(a*d-b*c)*e/d/(d*x+c))^4))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 20306 vs. $2(424) = 848$.
time = 3.05, size = 20306, normalized size = 43.86

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^7,x, alg
orithm="maxima")
```

```
[Out] 1/10*I*(6*b*x + a)*B^2*c^2*d*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^8*g^
7*x^6 + 6*a*b^7*g^7*x^5 + 15*a^2*b^6*g^7*x^4 + 20*a^3*b^5*g^7*x^3 + 15*a^4*
b^4*g^7*x^2 + 6*a^5*b^3*g^7*x + a^6*b^2*g^7) + 1/20*I*(15*b^2*x^2 + 6*a*b*x
 + a^2)*B^2*c*d^2*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^9*g^7*x^6 + 6*a
*b^8*g^7*x^5 + 15*a^2*b^7*g^7*x^4 + 20*a^3*b^6*g^7*x^3 + 15*a^4*b^5*g^7*x^2
 + 6*a^5*b^4*g^7*x + a^6*b^3*g^7) + 1/60*I*(20*b^3*x^3 + 15*a*b^2*x^2 + 6*a
^2*b*x + a^3)*B^2*d^3*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(b^10*g^7*x^6
+ 6*a*b^9*g^7*x^5 + 15*a^2*b^8*g^7*x^4 + 20*a^3*b^7*g^7*x^3 + 15*a^4*b^6*g^
7*x^2 + 6*a^5*b^5*g^7*x + a^6*b^4*g^7) - 1/10800*I*(60*((60*b^5*d^5*x^5 - 1
0*b^5*c^5 + 62*a*b^4*c^4*d - 163*a^2*b^3*c^3*d^2 + 237*a^3*b^2*c^2*d^3 - 21
3*a^4*b*c*d^4 + 147*a^5*d^5 - 30*(b^5*c*d^4 - 11*a*b^4*d^5)*x^4 + 20*(b^5*c
^2*d^3 - 8*a*b^4*c*d^4 + 37*a^2*b^3*d^5)*x^3 - 15*(b^5*c^3*d^2 - 7*a*b^4*c^
2*d^3 + 23*a^2*b^3*c*d^4 - 57*a^3*b^2*d^5)*x^2 + 6*(2*b^5*c^4*d - 13*a*b^4*
c^3*d^2 + 37*a^2*b^3*c^2*d^3 - 63*a^3*b^2*c*d^4 + 87*a^4*b*d^5)*x)/((b^12*c
^5 - 5*a*b^11*c^4*d + 10*a^2*b^10*c^3*d^2 - 10*a^3*b^9*c^2*d^3 + 5*a^4*b^8*
c*d^4 - a^5*b^7*d^5)*g^7*x^6 + 6*(a*b^11*c^5 - 5*a^2*b^10*c^4*d + 10*a^3*b^
9*c^3*d^2 - 10*a^4*b^8*c^2*d^3 + 5*a^5*b^7*c*d^4 - a^6*b^6*d^5)*g^7*x^5 + 1
5*(a^2*b^10*c^5 - 5*a^3*b^9*c^4*d + 10*a^4*b^8*c^3*d^2 - 10*a^5*b^7*c^2*d^3
 + 5*a^6*b^6*c*d^4 - a^7*b^5*d^5)*g^7*x^4 + 20*(a^3*b^9*c^5 - 5*a^4*b^8*c^4
*d + 10*a^5*b^7*c^3*d^2 - 10*a^6*b^6*c^2*d^3 + 5*a^7*b^5*c*d^4 - a^8*b^4*d^
5)*g^7*x^3 + 15*(a^4*b^8*c^5 - 5*a^5*b^7*c^4*d + 10*a^6*b^6*c^3*d^2 - 10*a^
7*b^5*c^2*d^3 + 5*a^8*b^4*c*d^4 - a^9*b^3*d^5)*g^7*x^2 + 6*(a^5*b^7*c^5 - 5
*a^6*b^6*c^4*d + 10*a^7*b^5*c^3*d^2 - 10*a^8*b^4*c^2*d^3 + 5*a^9*b^3*c*d^4
- a^10*b^2*d^5)*g^7*x + (a^6*b^6*c^5 - 5*a^7*b^5*c^4*d + 10*a^8*b^4*c^3*d^2
```

```
 - 10*a^9*b^3*c^2*d^3 + 5*a^10*b^2*c*d^4 - a^11*b*d^5)*g^7) + 60*d^6*log(b*
x + a)/((b^7*c^6 - 6*a*b^6*c^5*d + 15*a^2*b^5*c^4*d^2 - 20*a^3*b^4*c^3*d^3
+ 15*a^4*b^3*c^2*d^4 - 6*a^5*b^2*c*d^5 + a^6*b*d^6)*g^7) - 60*d^6*log(d*x +
 c)/((b^7*c^6 - 6*a*b^6*c^5*d + 15*a^2*b^5*c^4*d^2 - 20*a^3*b^4*c^3*d^3 + 1
5*a^4*b^3*c^2*d^4 - 6*a^5*b^2*c*d^5 + a^6*b*d^6)*g^7))*log(b*x*e/(d*x + c)
+ a*e/(d*x + c)) - (100*b^6*c^6 - 864*a*b^5*c^5*d + 3375*a^2*b^4*c^4*d^2 -
8000*a^3*b^3*c^3*d^3 + 13500*a^4*b^2*c^2*d^4 - 21600*a^5*b*c*d^5 + 13489*a^
6*d^6 - 8820*(b^6*c*d^5 - a*b^5*d^6)*x^5 + 90*(29*b^6*c^2*d^4 - 548*a*b^5*c
*d^5 + 519*a^2*b^4*d^6)*x^4 - 60*(19*b^6*c^3*d^3 - 231*a*b^5*c^2*d^4 + 1875
*a^2*b^4*c*d^5 - 1663*a^3*b^3*d^6)*x^3 + 15*(37*b^6*c^4*d^2 - 376*a*b^5*c^3
*d^3 + 1950*a^2*b^4*c^2*d^4 - 8800*a^3*b^3*c*d^5 + 7189*a^4*b^2*d^6)*x^2 +
1800*(b^6*d^6*x^6 + 6*a*b^5*d^6*x^5 + 15*a^2*b^4*d^6*x^4 + 20*a^3*b^3*d^6*x
^3 + 15*a^4*b^2*d^6*x^2 + 6*a^5*b*d^6*x + a^6*d^6)*log(b*x + a)^2 + 1800*(b
^6*d^6*x^6 + 6*a*b^5*d^6*x^5 + 15*a^2*b^4*d^6*x^4 + 20*a^3*b^3*d^6*x^3 + 15
*a^4*b^2*d^6*x^2 + 6*a^5*b*d^6*x + a^6*d^6)*log(d*x + c)^2 - 6*(44*b^6*c^5*
d - 405*a*b^5*c^4*d^2 + 1750*a^2*b^4*c^3*d^3 - 5000*a^3*b^3*c^2*d^4 + 13500
*a^4*b^2*c*d^5 - 9889*a^5*b*d^6)*x - 8820*(b^6*d^6*x^6 + 6*a*b^5*d^6*x^5 +
15*a^2*b^4*d^6*x^4 + 20*a^3*b^3*d^6*x^3 + 15*a^4*b^2*d^6*x^2 + 6*a^5*b*d^6*
x + a^6*d^6)*log(b*x + a) + 180*(49*b^6*d^6*x^6 + 294*a*b^5*d^6*x^5 + 735*a
^2*b^4*d^6*x^4 + 980*a^3*b^3*d^6*x^3 + 735*a^4*b^2*d^6*x^2 + 294*a^5*b*d^6*
x + 49*a^6*d^6 - 20*(b^6*d^6*x^6 + 6*a*b^5*d^6*x^5 + 15*a^2*b^4*d^6*x^4 + 2
0*a^3*b^3*d^6*x^3 + 15*a^4*b^2*d^6*x^2 + 6*a^5*b*d^6*x + a^6*d^6)*log(b*x +
 a))*log(d*x + c))/(a^6*b^7*c^6*g^7 - 6*a^7*b^6*c^5*d*g^7 + 15*a^8*b^5*c^4*
d^2*g^7 - 20*a^9*b^4*c^3*d^3*g^7 + 15*a^10*b^3*c^2*d^4*g^7 - 6*a^11*b^2*c*d
^5*g^7 + a^12*b*d^6*g^7 + (b^13*c^6*g^7 - 6*a*b^12*c^5*d*g^7 + 15*a^2*b^11*
c^4*d^2*g^7 - 20*a^3*b^10*c^3*d^3*g^7 + 15*a^4*b^9*c^2*d^4*g^7 - 6*a^5*b^8*
c*d^5*g^7 + a^6*b^7*d^6*g^7)*x^6 + 6*(a*b^12*c^6*g^7 - 6*a^2*b^11*c^5*d*g^7
 + 15*a^3*b^10*c^4*d^2*g^7 - 20*a^4*b^9*c^3*d^3*g^7 + 15*a^5*b^8*c^2*d^4*g^
7 - 6*a^6*b^7*c*d^5*g^7 + a^7*b^6*d^6*g^7)*x^5 + 15*(a^2*b^11*c^6*g^7 - 6*a
^3*b^10*c^5*d*g^7 + 15*a^4*b^9*c^4*d^2*g^7 - 20*a^5*b^8*c^3*d^3*g^7 + 15*a^
6*b^7*c^2*d^4*g^7 - 6*a^7*b^6*c*d^5*g^7 + a^8*b^5*d^6*g^7)*x^4 + 20*(a^3*b^
10*c^6*g^7 - 6*a^4*b^9*c^5*d*g^7 + 15*a^5*b^8*c^4*d^2*g^7 - 20*a^6*b^7*c^3*
d^3*g^7 + 15*a^7*b^6*c^2*d^4*g^7 - 6*a^8*b^5*c*d^5*g^7 + a^9*b^4*d^6*g^7)*x
^3 + 15*(a^4*b^9*c^6*g^7 - 6*a^5*b^8*c^5*d*g^7 + 15*a^6*b^7*c^4*d^2*g^7 - 2
0*a^7*b^6*c^3*d^3*g^7 + 15*a^8*b^5*c^2*d^4*g^7 - 6*a^9*b^4*c*d^5*g^7 + a^10
*b^3*d^6*g^7)*x^2 + 6*(a^5*b^8*c^6*g^7 - 6*a^6*b^7*c^5*d*g^7 + 15*a^7*b^6*c
^4*d^2*g^7 - 20*a^8*b^5*c^3*d^3*g^7 + 15*a^9*b^4*c^2*d^4*g^7 - 6*a^10*b^3*c
*d^5*g^7 + a^11*b^2*d^6*g^7)*x))*B^2*c^3 + 1/18000*I*(60*((22*a*b^5*c^5 - 1
40*a^2*b^4*c^4*d + 385*a^3*b^3*c^3*d^2 - 615*a^4*b^2*c^2*d^3 + 735*a^5*b*c*
d^4 - 87*a^6*d^5 + 60*(6*b^6*c*d^4 - a*b^5*d^5)*x^5 - 30*(6*b^6*c^2*d^3 - 6
7*a*b^5*c*d^4 + 11*a^2*b^4*d^5)*x^4 + 20*(6*b^6*c^3*d^2 - 49*a*b^5*c^2*d^3
+ 230*a^2*b^4*c*d^4 - 37*a^3*b^3*d^5)*x^3 - 15*(6*b^6*c^4*d - 43*a*b^5*c^3*
d^2 + 145*a^2*b^4*c^2*d^3 - 365*a^3*b^3*c*d^4 +...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than

twice the leaf count of optimal. 1568 vs. 2(424) = 848.
time = 0.44, size = 1568, normalized size = 3.39

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^7,x, alg
orithm="fricas")
```

```
[Out] 1/108000*(1000*(18*I*A^2 + 6*I*A*B + I*B^2)*b^6*c^6 + 1728*(-25*I*A^2 - 10*
I*A*B - 2*I*B^2)*a*b^5*c^5*d + 3375*(8*I*A^2 + 4*I*A*B + I*B^2)*a^2*b^4*c^4
*d^2 - (1800*I*A^2 + 2220*I*A*B + 919*I*B^2)*a^6*d^6 + 60*((60*I*A*B + 37*I
*B^2)*b^6*c*d^5 + (-60*I*A*B - 37*I*B^2)*a*b^5*d^6)*x^5 + 30*((-60*I*A*B +
23*I*B^2)*b^6*c^2*d^4 + 36*(20*I*A*B + 9*I*B^2)*a*b^5*c*d^5 + (-660*I*A*B -
 347*I*B^2)*a^2*b^4*d^6)*x^4 + 20*((1800*I*A^2 + 60*I*A*B - 53*I*B^2)*b^6*c
^3*d^3 + 27*(-200*I*A^2 - 20*I*A*B + 11*I*B^2)*a*b^5*c^2*d^4 + 675*(8*I*A^2
 + 4*I*A*B + I*B^2)*a^2*b^4*c*d^5 + (-1800*I*A^2 - 2220*I*A*B - 919*I*B^2)*
a^3*b^3*d^6)*x^3 + 15*((5400*I*A^2 + 1140*I*A*B + 73*I*B^2)*b^6*c^4*d^2 + 7
2*(-200*I*A^2 - 60*I*A*B - 7*I*B^2)*a*b^5*c^3*d^3 + 1350*(8*I*A^2 + 4*I*A*B
 + I*B^2)*a^2*b^4*c^2*d^4 + (-1800*I*A^2 - 2220*I*A*B - 919*I*B^2)*a^4*b^2*
d^6)*x^2 + 1800*(I*B^2*b^6*d^6*x^6 + 6*I*B^2*a*b^5*d^6*x^5 + 15*I*B^2*a^2*b
^4*d^6*x^4 + 10*I*B^2*b^6*c^6 - 24*I*B^2*a*b^5*c^5*d + 15*I*B^2*a^2*b^4*c^4
*d^2 + 20*(I*B^2*b^6*c^3*d^3 - 3*I*B^2*a*b^5*c^2*d^4 + 3*I*B^2*a^2*b^4*c*d^
5)*x^3 + 15*(3*I*B^2*b^6*c^4*d^2 - 8*I*B^2*a*b^5*c^3*d^3 + 6*I*B^2*a^2*b^4*
c^2*d^4)*x^2 + 6*(6*I*B^2*b^6*c^5*d - 15*I*B^2*a*b^5*c^4*d^2 + 10*I*B^2*a^2
*b^4*c^3*d^3)*x)*log((b*x + a)*e/(d*x + c))^2 + 6*(8*(1350*I*A^2 + 390*I*A*
B + 53*I*B^2)*b^6*c^5*d + 45*(-600*I*A^2 - 220*I*A*B - 39*I*B^2)*a*b^5*c^4*
d^2 + 2250*(8*I*A^2 + 4*I*A*B + I*B^2)*a^2*b^4*c^3*d^3 + (-1800*I*A^2 - 222
0*I*A*B - 919*I*B^2)*a^5*b*d^6)*x + 60*((60*I*A*B + 37*I*B^2)*b^6*d^6*x^6 +
 100*(6*I*A*B + I*B^2)*b^6*c^6 + 288*(-5*I*A*B - I*B^2)*a*b^5*c^5*d + 225*(
4*I*A*B + I*B^2)*a^2*b^4*c^4*d^2 + 6*(10*I*B^2*b^6*c*d^5 + 3*(20*I*A*B + 9*
I*B^2)*a*b^5*d^6)*x^5 + 15*(-2*I*B^2*b^6*c^2*d^4 + 24*I*B^2*a*b^5*c*d^5 + 1
5*(4*I*A*B + I*B^2)*a^2*b^4*d^6)*x^4 + 20*((60*I*A*B + I*B^2)*b^6*c^3*d^3 +
 9*(-20*I*A*B - I*B^2)*a*b^5*c^2*d^4 + 45*(4*I*A*B + I*B^2)*a^2*b^4*c*d^5)*
x^3 + 15*((180*I*A*B + 19*I*B^2)*b^6*c^4*d^2 + 24*(-20*I*A*B - 3*I*B^2)*a*b
^5*c^3*d^3 + 90*(4*I*A*B + I*B^2)*a^2*b^4*c^2*d^4)*x^2 + 6*(4*(90*I*A*B + 1
3*I*B^2)*b^6*c^5*d + 15*(-60*I*A*B - 11*I*B^2)*a*b^5*c^4*d^2 + 150*(4*I*A*B
 + I*B^2)*a^2*b^4*c^3*d^3)*x)*log((b*x + a)*e/(d*x + c)))/((b^13*c^3 - 3*a*
b^12*c^2*d + 3*a^2*b^11*c*d^2 - a^3*b^10*d^3)*g^7*x^6 + 6*(a*b^12*c^3 - 3*a
^2*b^11*c^2*d + 3*a^3*b^10*c*d^2 - a^4*b^9*d^3)*g^7*x^5 + 15*(a^2*b^11*c^3
- 3*a^3*b^10*c^2*d + 3*a^4*b^9*c*d^2 - a^5*b^8*d^3)*g^7*x^4 + 20*(a^3*b^10*
c^3 - 3*a^4*b^9*c^2*d + 3*a^5*b^8*c*d^2 - a^6*b^7*d^3)*g^7*x^3 + 15*(a^4*b^
9*c^3 - 3*a^5*b^8*c^2*d + 3*a^6*b^7*c*d^2 - a^7*b^6*d^3)*g^7*x^2 + 6*(a^5*b
^8*c^3 - 3*a^6*b^7*c^2*d + 3*a^7*b^6*c*d^2 - a^8*b^5*d^3)*g^7*x + (a^6*b^7*
c^3 - 3*a^7*b^6*c^2*d + 3*a^8*b^5*c*d^2 - a^9*b^4*d^3)*g^7)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**7,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 4.16, size = 709, normalized size = 1.53

$$\frac{\left(18000i\,B^2b^2e^7\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{43200i\,(bxe+ae)B^2bde^6\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+\frac{27000i\,(bxe+ae)^2B^2d^2e^5\log\left(\frac{bxe+ae}{dx+c}\right)^2}{(dx+c)^2}+36000i\,ABb^2e^7\log\left(\frac{bxe+ae}{dx+c}\right)+6000i\,B^2b^2e^7\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{86400i\,(bxe+ae)ABbde^6\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{17280i\,(bxe+ae)B^2bde^6\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{54000i\,(bxe+ae)^2ABd^2e^5\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+\frac{13500i\,(bxe+ae)^2B^2d^2e^5\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+18000i\,A^2b^2e^7+6000i\,ABb^2e^7+1000i\,B^2b^2e^7-\frac{43200i\,(bxe+ae)A^2bde^6}{dx+c}-\frac{17280i\,(bxe+ae)ABbde^6}{dx+c}-\frac{3456i\,(bxe+ae)B^2bde^6}{dx+c}+\frac{27000i\,(bxe+ae)^2A^2d^2e^5}{(dx+c)^2}+\frac{13500i\,(bxe+ae)^2ABd^2e^5}{(dx+c)^2}+\frac{3375i\,(bxe+ae)^2B^2d^2e^5}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{108000\left(\frac{(bxe+ae)^6b^2c^2g^7}{(dx+c)^6}-\frac{2\,(bxe+ae)^6abcdg^7}{(dx+c)^6}+\frac{(bxe+ae)^6a^2d^2g^7}{(dx+c)^6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^7,x, alg
orithm="giac")
```

```
[Out] 1/108000*(18000*I*B^2*b^2*e^7*log((b*x*e + a*e)/(d*x + c))^2 - 43200*I*(b*x
*e + a*e)*B^2*b*d*e^6*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 27000*I*(b
*x*e + a*e)^2*B^2*d^2*e^5*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^2 + 3600
0*I*A*B*b^2*e^7*log((b*x*e + a*e)/(d*x + c)) + 6000*I*B^2*b^2*e^7*log((b*x*
e + a*e)/(d*x + c)) - 86400*I*(b*x*e + a*e)*A*B*b*d*e^6*log((b*x*e + a*e)/(
d*x + c))/(d*x + c) - 17280*I*(b*x*e + a*e)*B^2*b*d*e^6*log((b*x*e + a*e)/(
d*x + c))/(d*x + c) + 54000*I*(b*x*e + a*e)^2*A*B*d^2*e^5*log((b*x*e + a*e)
/(d*x + c))/(d*x + c)^2 + 13500*I*(b*x*e + a*e)^2*B^2*d^2*e^5*log((b*x*e +
a*e)/(d*x + c))/(d*x + c)^2 + 18000*I*A^2*b^2*e^7 + 6000*I*A*B*b^2*e^7 + 10
00*I*B^2*b^2*e^7 - 43200*I*(b*x*e + a*e)*A^2*b*d*e^6/(d*x + c) - 17280*I*(b
*x*e + a*e)*A*B*b*d*e^6/(d*x + c) - 3456*I*(b*x*e + a*e)*B^2*b*d*e^6/(d*x +
 c) + 27000*I*(b*x*e + a*e)^2*A^2*d^2*e^5/(d*x + c)^2 + 13500*I*(b*x*e + a*
e)^2*A*B*d^2*e^5/(d*x + c)^2 + 3375*I*(b*x*e + a*e)^2*B^2*d^2*e^5/(d*x + c)
^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))
/((b*x*e + a*e)^6*b^2*c^2*g^7/(d*x + c)^6 - 2*(b*x*e + a*e)^6*a*b*c*d*g^7/(
d*x + c)^6 + (b*x*e + a*e)^6*a^2*d^2*g^7/(d*x + c)^6)
```

Mupad [**B**]
time = 14.17, size = 2500, normalized size = 5.40

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(a*g + b*g*x)^
7,x)
```

[Out] ((1800*A^2*a^5*d^5*i^3 + 18000*A^2*b^5*c^5*i^3 + 919*B^2*a^5*d^5*i^3 + 1000
*B^2*b^5*c^5*i^3 + 2220*A*B*a^5*d^5*i^3 + 6000*A*B*b^5*c^5*i^3 - 25200*A^2*
a*b^4*c^4*d*i^3 + 1800*A^2*a^4*b*c*d^4*i^3 - 2456*B^2*a*b^4*c^4*d*i^3 + 919
*B^2*a^4*b*c*d^4*i^3 + 1800*A^2*a^2*b^3*c^3*d^2*i^3 + 1800*A^2*a^3*b^2*c^2*
d^3*i^3 + 919*B^2*a^2*b^3*c^3*d^2*i^3 + 919*B^2*a^3*b^2*c^2*d^3*i^3 + 2220*
A*B*a^2*b^3*c^3*d^2*i^3 + 2220*A*B*a^3*b^2*c^2*d^3*i^3 - 11280*A*B*a*b^4*c^
4*d*i^3 + 2220*A*B*a^4*b*c*d^4*i^3)/(60*(a*d - b*c)) + (x^4*(347*B^2*a*b^4*
d^5*i^3 + 23*B^2*b^5*c*d^4*i^3 + 660*A*B*a*b^4*d^5*i^3 - 60*A*B*b^5*c*d^4*i
^3))/(2*(a*d - b*c)) + (x^2*(1800*A^2*a^3*b^2*d^5*i^3 + 919*B^2*a^3*b^2*d^5
*i^3 + 5400*A^2*b^5*c^3*d^2*i^3 + 73*B^2*b^5*c^3*d^2*i^3 - 9000*A^2*a*b^4*c
^2*d^3*i^3 + 1800*A^2*a^2*b^3*c*d^4*i^3 - 431*B^2*a*b^4*c^2*d^3*i^3 + 919*B
^2*a^2*b^3*c*d^4*i^3 + 2220*A*B*a^3*b^2*d^5*i^3 + 1140*A*B*b^5*c^3*d^2*i^3
- 3180*A*B*a*b^4*c^2*d^3*i^3 + 2220*A*B*a^2*b^3*c*d^4*i^3))/(4*(a*d - b*c))
 + (x^3*(1800*A^2*a^2*b^3*d^5*i^3 + 919*B^2*a^2*b^3*d^5*i^3 + 1800*A^2*b^5*
c^2*d^3*i^3 - 53*B^2*b^5*c^2*d^3*i^3 - 3600*A^2*a*b^4*c*d^4*i^3 + 244*B^2*a
*b^4*c*d^4*i^3 + 2220*A*B*a^2*b^3*d^5*i^3 + 60*A*B*b^5*c^2*d^3*i^3 - 480*A*
B*a*b^4*c*d^4*i^3))/(3*(a*d - b*c)) + (x*(1800*A^2*a^4*b*d^5*i^3 + 919*B^2*
a^4*b*d^5*i^3 + 10800*A^2*b^5*c^4*d*i^3 + 424*B^2*b^5*c^4*d*i^3 - 16200*A^2
*a*b^4*c^3*d^2*i^3 + 1800*A^2*a^3*b^2*c*d^4*i^3 - 1331*B^2*a*b^4*c^3*d^2*i^
3 + 919*B^2*a^3*b^2*c*d^4*i^3 + 2220*A*B*a^4*b*d^5*i^3 + 3120*A*B*b^5*c^4*d
*i^3 + 1800*A^2*a^2*b^3*c^2*d^3*i^3 + 919*B^2*a^2*b^3*c^2*d^3*i^3 - 6780*A*
B*a*b^4*c^3*d^2*i^3 + 2220*A*B*a^3*b^2*c*d^4*i^3 + 2220*A*B*a^2*b^3*c^2*d^3
i^3))/(10(a*d - b*c)) + (d*x^5*(37*B^2*b^5*d^4*i^3 + 60*A*B*b^5*d^4*i^3))
/(a*d - b*c))/(x*(10800*a^5*b^6*c*g^7 - 10800*a^6*b^5*d*g^7) - x^5*(10800*a
^2*b^9*d*g^7 - 10800*a*b^10*c*g^7) + x^6*(1800*b^11*c*g^7 - 1800*a*b^10*d*g
^7) + x^2*(27000*a^4*b^7*c*g^7 - 27000*a^5*b^6*d*g^7) + x^4*(27000*a^2*b^9*
c*g^7 - 27000*a^3*b^8*d*g^7) + x^3*(36000*a^3*b^8*c*g^7 - 36000*a^4*b^7*d*g
^7) + 1800*a^6*b^5*c*g^7 - 1800*a^7*b^4*d*g^7) - log((e*(a + b*x))/(c + d*x
))^2*((x*(a*(b*((B^2*a*d^3*i^3)/(60*b^5*g^7) + (B^2*c*d^2*i^3)/(20*b^4*g^7)
) + (B^2*a*d^3*i^3)/(15*b^4*g^7) + (B^2*c*d^2*i^3)/(5*b^3*g^7)) + b*(a*((B^
2*a*d^3*i^3)/(60*b^5*g^7) + (B^2*c*d^2*i^3)/(20*b^4*g^7)) + (B^2*c^2*d*i^3)
/(10*b^3*g^7)) + (B^2*c^2*d*i^3)/(2*b^2*g^7)) + x^2*(b*(b*((B^2*a*d^3*i^3)/
(60*b^5*g^7) + (B^2*c*d^2*i^3)/(20*b^4*g^7)) + (B^2*a*d^3*i^3)/(15*b^4*g^7)
 + (B^2*c*d^2*i^3)/(5*b^3*g^7)) + (B^2*a*d^3*i^3)/(6*b^3*g^7) + (B^2*c*d^2*
i^3)/(2*b^2*g^7)) + a*(a*((B^2*a*d^3*i^3)/(60*b^5*g^7) + (B^2*c*d^2*i^3)/(2
0*b^4*g^7)) + (B^2*c^2*d*i^3)/(10*b^3*g^7)) + (B^2*c^3*i^3)/(6*b^2*g^7) + (
B^2*d^3*i^3*x^3)/(3*b^2*g^7))/(6*a^5*x + a^6/b + b^5*x^6 + 15*a^4*b*x^2 + 6
*a*b^4*x^5 + 20*a^3*b^2*x^3 + 15*a^2*b^3*x^4) - (B^2*d^6*i^3)/(60*b^4*g^7*(
a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) - (log((e*(a + b*x))/(
c + d*x))*(a*(a*((B*d*i^3*(9*A*b*c - B*a*d + B*b*c))/(90*b^5*g^7) + (A*B*a*
d^2*i^3)/(30*b^5*g^7)) + (B*i^3*(36*A*b^2*c^2 - 3*B*a^2*d^2 + 5*B*b^2*c^2 -
 2*B*a*b*c*d))/(180*b^5*g^7)) + x^2*(b*(b*((B*d*i^3*(9*A*b*c - B*a*d + B*b*
c))/(90*b^5*g^7) + (A*B*a*d^2*i^3)/(30*b^5*g^7)) + (2*B*d*i^3*(9*A*b*c - B*
a*d + B*b*c))/(45*b^4*g^7) + (2*A*B*a*d^2*i^3)/(15*b^4*g^7)) + (B*d*i^3*(9*
A*b*c - B*a*d + B*b*c))/(9*b^3*g^7) + (A*B*a*d^2*i^3)/(3*b^3*g^7) + (B^2*d^

```
6*i^3*(b*((20*a^4*d^4 + b^4*c^4 + 21*a^2*b^2*c^2*d^2 - 7*a*b^3*c^3*d - 35*a
^3*b*c*d^3)/(15*d^5) + b*(a*(a*((6*a^2*d^2 + b^2*c^2 - 7*a*b*c*d)/(30*b*d^3
) + (a*(a*d - b*c))/(6*b*d^2)) + (15*a^3*d^3 - b^3*c^3 + 7*a*b^2*c^2*d - 21
*a^2*b*c*d^2)/(60*b*d^4)) + (20*a^4*d^4 + b^4*c^4 + 21*a^2*b^2*c^2*d^2 - 7*
a*b^3*c^3*d - 35*a^3*b*c*d^3)/(60*b*d^5)) + a*(b*(a*((6*a^2*d^2 + b^2*c^2 -
 7*a*b*c*d)/(30*b*d^3) + (a*(a*d - b*c))/(6*b*d^2)) + (15*a^3*d^3 - b^3*c^3
 + 7*a*b^2*c^2*d - 21*a^2*b*c*d^2)/(60*b*d^4)) + a*(b*((6*a^2*d^2 + b^2*c^2
 - 7*a*b*c*d)/(30*b*d^3) + (a*(a*d - b*c))/(6*b*d^2)) + (6*a^2*d^2 + b^2*c^
2 - 7*a*b*c*d)/(15*d^3) + (a*(a*d - b*c))/(3*d^2)) + (15*a^3*d^3 - b^3*c^3
+ 7*a*b^2*c^2*d - 21*a^2*b*c*d^2)/(20*d^4))) + a*(a*(b*(b*((6*a^2*d^2 + b^2
*c^2 - 7*a*b*c*d)/(30*b*d^3) + (a*(a*d - b*c))/(6*b*d^2)) + (6*a^2*d^2 + b^
2*c^2 - 7*a*b*c*d)/(15*d^3) + (a*(a*d - b*c))/(3*d^2)) - a*((b^2*c - a*b*d)
/(6*d^2) - (b*(a*d - b*c))/(3*d^2)) + (b^3*c^2 + 6*a^2*b*d^2 - 7*a*b^2*c*d)
/(10*d^3)) - (b^4*c^3 - 15*a^3*b*d^3 + 21*a^2*b^2*c*d^2 - 7*a*b^3*c^2*d)/(1
0*d^4) + b*(b*(a*((6*a^2*d^2 + b^2*c^2 - 7*a*b*c*d)/(30*b*d^3) + (a*(a*d -
b*c))/(6*b*d^2)) + (15*a^3*d^3 - b^3*c^3 + 7*a*b^2*c^2*d - 21*a^2*b*c*d^2)/
(60*b*d^4)) + a*(b*((6*a^2*d^2 + b^2*c^2 - 7*a*b*c*d)/(30*b*d^3) + (a*(a*d
- b*c))/(6*b*d^2)) + (6*a^2*d^2 + b^2*c^2 - 7*a*b*c*d)/(15*d^3) + (a*(a*d -
 b*c))/(3*d^2)) + (15*a^3*d^3 - b^3*c^3 + 7*a*b^2*c^2*d - 21*a^2*b*c*d^2)/(
20*d^4))) + (b^5*c^4 + 20*a^4*b*d^4 - 35*a^3*b^2*c*d^3 + 21*a^2*b^3*c^2*d^2
 - 7*a*b^4*c^3*d)/(6*d^5)))/(30*b^4*g^7*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d
- 3*a^2*b*c*d^2))) + x*(b*(a*((B*d*i^3*(9*A*b*c...
```

3.84 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=718

$$\frac{bB^2(bc-ad)^2g^3x}{3d^3i}+\frac{B^2(bc-ad)^3g^3\log\left(\frac{a+bx}{c+dx}\right)}{3d^4i}+\frac{7B(bc-ad)^2g^3(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d^3i}-\frac{b^2B(bc-ad}{}$$

```
[Out] 1/3*b*B^2*(-a*d+b*c)^2*g^3*x/d^3/i+1/3*B^2*(-a*d+b*c)^3*g^3*ln((b*x+a)/(d*x
+c))/d^4/i+7/3*B*(-a*d+b*c)^2*g^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3/i
-1/3*b^2*B*(-a*d+b*c)*g^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^4/i+6*B*(
-a*d+b*c)^3*g^3*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^4/i+
3*(-a*d+b*c)^2*g^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^3/i-3/2*b^2*(-a*
d+b*c)*g^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^4/i+1/3*b^3*g^3*(d*x+c
)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^4/i+(-a*d+b*c)^3*g^3*ln((-a*d+b*c)/b/(d
*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^4/i-2*B^2*(-a*d+b*c)^3*g^3*ln(d*x+c)
/d^4/i-7/3*B*(-a*d+b*c)^3*g^3*(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(1-b*(d*x+c)/d/
(b*x+a))/d^4/i+6*B^2*(-a*d+b*c)^3*g^3*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i+
2*B*(-a*d+b*c)^3*g^3*(A+B*ln(e*(b*x+a)/(d*x+c)))*polylog(2,d*(b*x+a)/b/(d*x
+c))/d^4/i+7/3*B^2*(-a*d+b*c)^3*g^3*polylog(2,b*(d*x+c)/d/(b*x+a))/d^4/i-2*
B^2*(-a*d+b*c)^3*g^3*polylog(3,d*(b*x+a)/b/(d*x+c))/d^4/i
```

Rubi [A]
time = 0.64, antiderivative size = 718, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 13, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {2562, 2395, 2356, 2389, 2379, 2438, 2351, 31, 46, 2355, 2354, 2421, 6724}

$$\frac{2Bg^3(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^4i}+\frac{6B^2g^3(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i}+\frac{7B^2g^3(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{3d^4i}-\frac{2B^2g^3(bc-ad)^3\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i}+\frac{b^3g^3(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3d^4i}-\frac{3b^2g^3(c+dx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2d^4i}-\frac{b^2Bg^3(c+dx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d^4i}+\frac{g^3(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^4i}+\frac{6Bg^3(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^4i}-\frac{7Bg^3(bc-ad)^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d^4i}+\frac{3g^3(a+bx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^3i}+\frac{7Bg^3(a+bx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d^3i}+\frac{B^2g^3(bc-ad)^3\log\left(\frac{a+bx}{c+dx}\right)}{3d^4i}-\frac{2B^2g^3(bc-ad)^3\log(c+dx)}{d^4i}+\frac{bB^2g^3x(bc-ad)^2}{3d^3i}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x),
x]
```

```
[Out] (b*B^2*(b*c - a*d)^2*g^3*x)/(3*d^3*i) + (B^2*(b*c - a*d)^3*g^3*Log[(a + b*x
)/(c + d*x)])/(3*d^4*i) + (7*B*(b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(3*d^3*i) - (b^2*B*(b*c - a*d)*g^3*(c + d*x)^2*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(3*d^4*i) + (6*B*(b*c - a*d)^3*g^3*Log[(b*c
 - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^4*i) + (3*(
b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i)
- (3*b^2*(b*c - a*d)*g^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2
)/(2*d^4*i) + (b^3*g^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(3*d^4*i) + ((b*c - a*d)^3*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^2)/(d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*Log[c + d*x])
/(d^4*i) - (7*B*(b*c - a*d)^3*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[
```

```
1 - (b*(c + d*x))/(d*(a + b*x))])/(3*d^4*i) + (6*B^2*(b*c - a*d)^3*g^3*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i) + (2*B*(b*c - a*d)^3*g^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d
^4*i) + (7*B^2*(b*c - a*d)^3*g^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(
3*d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]
)/(d^4*i)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
```

```
NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84c+84dx}\,dx = \int \left(\frac{b(bc-ad)^2g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3} + \frac{(-bc+ad)^3g^3\left(A \ldots}{d^3(84c \ldots}\right.$$

$$= \frac{(bg)\int (ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{84d} - \frac{(b(bc-ad)g^2) \ldots}{\ldots}$$

$$= \frac{b(bc-ad)^2g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3} - \frac{(bc-ad)g^3(a+bx)^2 \ldots}{16 \ldots}$$

$$= \frac{b(bc-ad)^2g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3} - \frac{(bc-ad)g^3(a+bx)^2 \ldots}{16 \ldots}$$

$$= \frac{b(bc-ad)^2g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3} - \frac{(bc-ad)g^3(a+bx)^2 \ldots}{16 \ldots}$$

$$= \frac{b(bc-ad)^2g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3} - \frac{(bc-ad)g^3(a+bx)^2 \ldots}{16 \ldots}$$

$$= \frac{5AbB(bc-ad)^2g^3x}{252d^3} - \frac{B(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+ \ldots}{c+d \ldots}\right.\right.}{252d^2}$$

$$= \frac{5AbB(bc-ad)^2g^3x}{252d^3} + \frac{5B^2(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{252d^3} - \ldots$$

$$= \frac{5AbB(bc-ad)^2g^3x}{252d^3} + \frac{5B^2(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{252d^3} - \ldots$$

$$= \frac{5AbB(bc-ad)^2g^3x}{252d^3} + \frac{bB^2(bc-ad)^2g^3x}{252d^3} + \frac{5B^2(bc-ad)^2g^3(a \ldots}{252 \ldots}$$

$$= \frac{5AbB(bc-ad)^2g^3x}{252d^3} + \frac{bB^2(bc-ad)^2g^3x}{252d^3} + \frac{5B^2(bc-ad)^2g^3(a \ldots}{252 \ldots}$$

$$= \frac{5AbB(bc-ad)^2g^3x}{252d^3} + \frac{bB^2(bc-ad)^2g^3x}{252d^3} - \frac{aB^2(bc-ad)^2g^3\log \ldots}{84d^3}$$

$$= \frac{5AbB(bc-ad)^2g^3x}{252d^3} + \frac{bB^2(bc-ad)^2g^3x}{252d^3} - \frac{aB^2(bc-ad)^2g^3\log \ldots}{84d^3}$$

$$= \frac{5AbB(bc-ad)^2g^3x}{252d^3} + \frac{bB^2(bc-ad)^2g^3x}{252d^3} - \frac{aB^2(bc-ad)^2g^3\log \ldots}{84d^3}$$

$$= \frac{5AbB(bc-ad)^2g^3x}{252d^3} + \frac{bB^2(bc-ad)^2g^3x}{252d^3} - \frac{aB^2(bc-ad)^2g^3\log \ldots}{84d^3}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 4802 vs. $2(718) = 1436$.
time = 1.19, size = 4802, normalized size = 6.69

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x),x]
```

```
[Out] (g^3*(12*A*b^3*B*c^3 - 48*a*A*b^2*B*c^2*d - 22*a*b^2*B^2*c^2*d + 72*a^2*A*b
*B*c*d^2 + 54*a^2*b*B^2*c*d^2 - 36*a^3*A*B*d^3 - 36*a^3*B^2*d^3 + 6*A^2*b^3
*c^2*d*x + 10*A*b^3*B*c^2*d*x + 2*b^3*B^2*c^2*d*x - 18*a*A^2*b^2*c*d^2*x -
24*a*A*b^2*B*c*d^2*x - 4*a*b^2*B^2*c*d^2*x + 18*a^2*A^2*b*d^3*x + 14*a^2*A*
b*B*d^3*x + 2*a^2*b*B^2*d^3*x - 3*A^2*b^3*c*d^2*x^2 - 2*A*b^3*B*c*d^2*x^2 +
 9*a*A^2*b^2*d^3*x^2 + 2*a*A*b^2*B*d^3*x^2 + 2*A^2*b^3*d^3*x^3 - 12*b^3*B^2
*c^3*Log[a/b + x] + 12*a*A*b^2*B*c^2*d*Log[a/b + x] + 58*a*b^2*B^2*c^2*d*Lo
g[a/b + x] - 36*a^2*A*b*B*c*d^2*Log[a/b + x] - 99*a^2*b*B^2*c*d^2*Log[a/b +
 x] + 36*a^3*A*B*d^3*Log[a/b + x] + 63*a^3*B^2*d^3*Log[a/b + x] - 6*a*b^2*B
^2*c^2*d*Log[a/b + x]^2 + 21*a^2*b*B^2*c*d^2*Log[a/b + x]^2 - 25*a^3*B^2*d^
3*Log[a/b + x]^2 - 12*A*b^3*B*c^3*Log[c/d + x] - 9*b^3*B^2*c^3*Log[c/d + x]
 + 36*a*A*b^2*B*c^2*d*Log[c/d + x] + 15*a*b^2*B^2*c^2*d*Log[c/d + x] - 36*a
^2*A*b*B*c*d^2*Log[c/d + x] + 36*a^2*b*B^2*c*d^2*Log[c/d + x] - 36*a^3*B^2*
d^3*Log[c/d + x] + 12*b^3*B^2*c^3*Log[a/b + x]*Log[c/d + x] - 36*a*b^2*B^2*
c^2*d*Log[a/b + x]*Log[c/d + x] + 30*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[c/d +
 x] + 14*a^3*B^2*d^3*Log[a/b + x]*Log[c/d + x] + 6*A*b^3*B*c^3*Log[c/d + x]
^2 - b^3*B^2*c^3*Log[c/d + x]^2 - 18*a*A*b^2*B*c^2*d*Log[c/d + x]^2 + 9*a*b
^2*B^2*c^2*d*Log[c/d + x]^2 + 18*a^2*A*b*B*c*d^2*Log[c/d + x]^2 - 18*a^2*b*
B^2*c*d^2*Log[c/d + x]^2 - 6*a^3*A*B*d^3*Log[c/d + x]^2 + 4*b^3*B^2*c^3*Log
[c/d + x]^3 - 12*a*b^2*B^2*c^2*d*Log[c/d + x]^3 + 12*a^2*b*B^2*c*d^2*Log[c/
d + x]^3 + 6*a^2*A*b*B*c*d^2*Log[a + b*x] + 5*a^2*b*B^2*c*d^2*Log[a + b*x]
 - 14*a^3*A*B*d^3*Log[a + b*x] - 15*a^3*B^2*d^3*Log[a + b*x] - 6*a^2*b*B^2*c
*d^2*Log[a/b + x]*Log[a + b*x] + 14*a^3*B^2*d^3*Log[a/b + x]*Log[a + b*x] +
 6*a^2*b*B^2*c*d^2*Log[c/d + x]*Log[a + b*x] - 14*a^3*B^2*d^3*Log[c/d + x]*
Log[a + b*x] - 6*b^3*B^2*c^3*Log[c/d + x]^2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] + 18*a*b^2*B^2*c^2*d*Log[c/d + x]^2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
18*a^2*b*B^2*c*d^2*Log[c/d + x]^2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 12*b^
3*B^2*c^3*Log[(e*(a + b*x))/(c + d*x)] - 48*a*b^2*B^2*c^2*d*Log[(e*(a + b*x
))/(c + d*x)] + 72*a^2*b*B^2*c*d^2*Log[(e*(a + b*x))/(c + d*x)] - 36*a^3*B^
2*d^3*Log[(e*(a + b*x))/(c + d*x)] + 12*A*b^3*B*c^2*d*x*Log[(e*(a + b*x))/(
c + d*x)] + 10*b^3*B^2*c^2*d*x*Log[(e*(a + b*x))/(c + d*x)] - 36*a*A*b^2*B*
c*d^2*x*Log[(e*(a + b*x))/(c + d*x)] - 24*a*b^2*B^2*c*d^2*x*Log[(e*(a + b*x
))/(c + d*x)] + 36*a^2*A*b*B*d^3*x*Log[(e*(a + b*x))/(c + d*x)] + 14*a^2*b*
B^2*d^3*x*Log[(e*(a + b*x))/(c + d*x)] - 6*A*b^3*B*c*d^2*x^2*Log[(e*(a + b*
x))/(c + d*x)] - 2*b^3*B^2*c*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] + 18*a*A*
```

```
b^2*B*d^3*x^2*Log[(e*(a + b*x))/(c + d*x)] + 2*a*b^2*B^2*d^3*x^2*Log[(e*(a
+ b*x))/(c + d*x)] + 4*A*b^3*B*d^3*x^3*Log[(e*(a + b*x))/(c + d*x)] + 12*a*
b^2*B^2*c^2*d*Log[a/b + x]*Log[(e*(a + b*x))/(c + d*x)] - 36*a^2*b*B^2*c*d^
2*Log[a/b + x]*Log[(e*(a + b*x))/(c + d*x)] + 36*a^3*B^2*d^3*Log[a/b + x]*L
og[(e*(a + b*x))/(c + d*x)] - 12*b^3*B^2*c^3*Log[c/d + x]*Log[(e*(a + b*x))
/(c + d*x)] + 36*a*b^2*B^2*c^2*d*Log[c/d + x]*Log[(e*(a + b*x))/(c + d*x)]
- 36*a^2*b*B^2*c*d^2*Log[c/d + x]*Log[(e*(a + b*x))/(c + d*x)] + 6*b^3*B^2*
c^3*Log[c/d + x]^2*Log[(e*(a + b*x))/(c + d*x)] - 18*a*b^2*B^2*c^2*d*Log[c/
d + x]^2*Log[(e*(a + b*x))/(c + d*x)] + 18*a^2*b*B^2*c*d^2*Log[c/d + x]^2*L
og[(e*(a + b*x))/(c + d*x)] + 6*a^2*b*B^2*c*d^2*Log[a + b*x]*Log[(e*(a + b*
x))/(c + d*x)] - 14*a^3*B^2*d^3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] +
 6*b^3*B^2*c^2*d*x*Log[(e*(a + b*x))/(c + d*x)]^2 - 18*a*b^2*B^2*c*d^2*x*Lo
g[(e*(a + b*x))/(c + d*x)]^2 + 18*a^2*b*B^2*d^3*x*Log[(e*(a + b*x))/(c + d*
x)]^2 - 3*b^3*B^2*c*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)]^2 + 9*a*b^2*B^2*d^
3*x^2*Log[(e*(a + b*x))/(c + d*x)]^2 + 2*b^3*B^2*d^3*x^3*Log[(e*(a + b*x))/
(c + d*x)]^2 - 6*A^2*b^3*c^3*Log[c + d*x] - 10*A*b^3*B*c^3*Log[c + d*x] + 9
*b^3*B^2*c^3*Log[c + d*x] + 18*a*A^2*b^2*c^2*d*Log[c + d*x] + 18*a*A*b^2*B*
c^2*d*Log[c + d*x] - 37*a*b^2*B^2*c^2*d*Log[c + d*x] - 18*a^2*A^2*b*c*d^2*L
og[c + d*x] + 22*a^2*b*B^2*c*d^2*Log[c + d*x] + 6*a^3*A^2*d^3*Log[c + d*x]
+ 12*A*b^3*B*c^3*Log[a/b + x]*Log[c + d*x] + 10*b^3*B^2*c^3*Log[a/b + x]*Lo
g[c + d*x] - 36*a*A*b^2*B*c^2*d*Log[a/b + x]*Log[c + d*x] - 18*a*b^2*B^2*c^
2*d*Log[a/b + x]*Log[c + d*x] + 36*a^2*A*b*B*c*d^2*Log[a/b + x]*Log[c + d*x
] - 12*a^3*A*B*d^3*Log[a/b + x]*Log[c + d*x] - 6*b^3*B^2*c^3*Log[a/b + x]^2
*Log[c + d*x] + 18*a*b^2*B^2*c^2*d*Log[a/b + x]^2*Log[c + d*x] - 18*a^2*b*B
^2*c*d^2*Log[a/b + x]^2*Log[c + d*x] - 12*A*b^3*B*c^3*Log[c/d + x]*Log[c +
d*x] - 10*b^3*B^2*c^3*Log[c/d + x]*Log[c + d*x] + 36*a*A*b^2*B*c^2*d*Log[c/
d + x]*Log[c + d*x] + 18*a*b^2*B^2*c^2*d*Log[c/d + x]*Log[c + d*x] - 36*a^2
*A*b*B*c*d^2*Log[c/d + x]*Log[c + d*x] + 12*a^3*A*B*d^3*Log[c/d + x]*Log[c
+ d*x] + 12*b^3*B^2*c^3*Log[a/b + x]*Log[c/d + x]*Log[c + d*x] - 36*a*b^2*B
^2*c^2*d*Log[a/b + x]*Log[c/d + x]*Log[c + d*x] + 36*a^2*b*B^2*c*d^2*Log[a/
b + x]*Log[c/d + x]*Log[c + d*x] - 6*b^3*B^2*c^3*Log[c/d + x]^2*Log[c + d*x
] + 18*a*b^2*B^2*c^2*d*Log[c/d + x]^2*Log[c + d...
```

Maple [F]
time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^3 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] 3*A^2*a^2*b*g^3*(-I*x/d + I*c*log(d*x + c)/d^2) - 1/6*A^2*b^3*g^3*(-6*I*c^3
*log(d*x + c)/d^4 + I*(2*d^2*x^3 - 3*c*d*x^2 + 6*c^2*x)/d^3) - 3/2*A^2*a*b^
2*g^3*(2*I*c^2*log(d*x + c)/d^3 + I*(d*x^2 - 2*c*x)/d^2) - I*A^2*a^3*g^3*lo
g(I*d*x + I*c)/d + 1/6*(2*(I*b^3*c^3*g^3 - 3*I*a*b^2*c^2*d*g^3 + 3*I*a^2*b*
c*d^2*g^3 - I*a^3*d^3*g^3)*B^2*log(d*x + c)^3 - (2*I*B^2*b^3*d^3*g^3*x^3 -
3*(I*b^3*c*d^2*g^3 - 3*I*a*b^2*d^3*g^3)*B^2*x^2 - 6*(-I*b^3*c^2*d*g^3 + 3*I
*a*b^2*c*d^2*g^3 - 3*I*a^2*b*d^3*g^3)*B^2*x)*log(d*x + c)^2)/d^4 + integrat
e(1/3*(-6*I*A*B*a^3*d^2*g^3 - 3*I*B^2*a^3*d^2*g^3 - 3*(2*I*A*B*b^3*d^2*g^3
+ I*B^2*b^3*d^2*g^3)*x^3 - 9*(2*I*A*B*a*b^2*d^2*g^3 + I*B^2*a*b^2*d^2*g^3)*
x^2 - 3*(I*B^2*b^3*d^2*g^3*x^3 + 3*I*B^2*a*b^2*d^2*g^3*x^2 + 3*I*B^2*a^2*b*
d^2*g^3*x + I*B^2*a^3*d^2*g^3)*log(b*x + a)^2 - 9*(2*I*A*B*a^2*b*d^2*g^3 +
I*B^2*a^2*b*d^2*g^3)*x - 6*(I*A*B*a^3*d^2*g^3 + I*B^2*a^3*d^2*g^3 + (I*A*B*
b^3*d^2*g^3 + I*B^2*b^3*d^2*g^3)*x^3 + 3*(I*A*B*a*b^2*d^2*g^3 + I*B^2*a*b^2
*d^2*g^3)*x^2 + 3*(I*A*B*a^2*b*d^2*g^3 + I*B^2*a^2*b*d^2*g^3)*x)*log(b*x +
a) + (6*I*A*B*a^3*d^2*g^3 + 6*I*B^2*a^3*d^2*g^3 - 2*(-3*I*A*B*b^3*d^2*g^3 -
 4*I*B^2*b^3*d^2*g^3)*x^3 - 3*(-6*I*A*B*a*b^2*d^2*g^3 + (I*b^3*c*d*g^3 - 9*
I*a*b^2*d^2*g^3)*B^2)*x^2 - 6*(-3*I*A*B*a^2*b*d^2*g^3 + (-I*b^3*c^2*g^3 + 3
*I*a*b^2*c*d*g^3 - 6*I*a^2*b*d^2*g^3)*B^2)*x - 6*(-I*B^2*b^3*d^2*g^3*x^3 -
3*I*B^2*a*b^2*d^2*g^3*x^2 - 3*I*B^2*a^2*b*d^2*g^3*x - I*B^2*a^3*d^2*g^3)*lo
g(b*x + a))*log(d*x + c))/(d^3*x + c*d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] integral((-I*A^2*b^3*g^3*x^3 - 3*I*A^2*a*b^2*g^3*x^2 - 3*I*A^2*a^2*b*g^3*x
- I*A^2*a^3*g^3 + (-I*B^2*b^3*g^3*x^3 - 3*I*B^2*a*b^2*g^3*x^2 - 3*I*B^2*a^2
*b*g^3*x - I*B^2*a^3*g^3)*log((b*x + a)*e/(d*x + c))^2 - 2*(I*A*B*b^3*g^3*x
^3 + 3*I*A*B*a*b^2*g^3*x^2 + 3*I*A*B*a^2*b*g^3*x + I*A*B*a^3*g^3)*log((b*x
+ a)*e/(d*x + c)))/(d*x + c), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(I*d*x + I*c
), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x),
x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x),
 x)
```

3.85 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=536

$$-\frac{B(bc-ad)g^2(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2i}-\frac{4B(bc-ad)^2g^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^3i}-2(bc$$

```
[Out] -B*(-a*d+b*c)*g^2*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^2/i-4*B*(-a*d+b*c)^
2*g^2*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3/i-2*(-a*d+b*
c)*g^2*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^2/i+1/2*b^2*g^2*(d*x+c)^2*(A
+B*ln(e*(b*x+a)/(d*x+c)))^2/d^3/i-(-a*d+b*c)^2*g^2*ln((-a*d+b*c)/b/(d*x+c))
*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^3/i+B^2*(-a*d+b*c)^2*g^2*ln(d*x+c)/d^3/i+B
*(-a*d+b*c)^2*g^2*(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(1-b*(d*x+c)/d/(b*x+a))/d^3
/i-4*B^2*(-a*d+b*c)^2*g^2*polylog(2,d*(b*x+a)/b/(d*x+c))/d^3/i-2*B*(-a*d+b*
c)^2*g^2*(A+B*ln(e*(b*x+a)/(d*x+c)))*polylog(2,d*(b*x+a)/b/(d*x+c))/d^3/i-B
^2*(-a*d+b*c)^2*g^2*polylog(2,b*(d*x+c)/d/(b*x+a))/d^3/i+2*B^2*(-a*d+b*c)^2
*g^2*polylog(3,d*(b*x+a)/b/(d*x+c))/d^3/i
```

Rubi [A]
time = 0.43, antiderivative size = 536, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2562, 2395, 2356, 2389, 2379, 2438, 2351, 31, 2355, 2354, 2421, 6724}

$$-\frac{2Bg^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i}-\frac{4B^2g^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}-\frac{B^2g^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{d^3i}+\frac{2B^2g^2(bc-ad)^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}+\frac{b^2g^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2d^3i}-\frac{g^2(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^3i}-\frac{4Bg^2(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i}+\frac{Bg^2(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i}-\frac{2g^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^2i}-\frac{Bg^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i}+\frac{B^2g^2(bc-ad)^2\log(c+dx)}{d^3i}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x),
x]
```

```
[Out] -((B*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*i
)) - (4*B*(b*c - a*d)^2*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(d^3*i) - (2*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)])^2)/(d^2*i) + (b^2*g^2*(c + d*x)^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(2*d^3*i) - ((b*c - a*d)^2*g^2*Log[(b*c - a*d)/(b*(c
+ d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i) + (B^2*(b*c - a*d)
^2*g^2*Log[c + d*x])/(d^3*i) + (B*(b*c - a*d)^2*g^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(d^3*i) - (4*B^2*(b*c -
 a*d)^2*g^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i) - (2*B*(b*c -
a*d)^2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b
*(c + d*x))])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*PolyLog[2, (b*(c + d*x))/(d*
(a + b*x))])/(d^3*i) + (2*B^2*(b*c - a*d)^2*g^2*PolyLog[3, (d*(a + b*x))/(b
*(c + d*x))])/(d^3*i)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85c+85dx}\,dx = \int \left(-\frac{b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2} + \frac{(bc-ad)^2g^2\left(A+\right.}{d^2(85c}\right.$$

$$= \frac{(bg)\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{85d} - \frac{(b(bc-ad)g^2)\int}{}$$

$$= -\frac{b(bc-ad)g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2} + \frac{g^2(a+bx)^2\left(A+B\right.}{170d}$$

$$= -\frac{b(bc-ad)g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2} + \frac{g^2(a+bx)^2\left(A+B\right.}{170d}$$

$$= -\frac{b(bc-ad)g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2} + \frac{g^2(a+bx)^2\left(A+B\right.}{170d}$$

$$= -\frac{b(bc-ad)g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2} + \frac{g^2(a+bx)^2\left(A+B\right.}{170d}$$

$$= -\frac{AbB(bc-ad)g^2x}{85d^2} - \frac{2aB(bc-ad)g^2\log(a+bx)\left(A+B\log\right.}{85d^2}$$

$$= -\frac{AbB(bc-ad)g^2x}{85d^2} - \frac{B^2(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{85d^2} -$$

$$= -\frac{AbB(bc-ad)g^2x}{85d^2} - \frac{B^2(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{85d^2} -$$

$$= -\frac{AbB(bc-ad)g^2x}{85d^2} - \frac{B^2(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{85d^2} -$$

$$= -\frac{AbB(bc-ad)g^2x}{85d^2} - \frac{B^2(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{85d^2} -$$

$$= -\frac{AbB(bc-ad)g^2x}{85d^2} + \frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2} - \frac{B^2(bc-}{}$$

$$= -\frac{AbB(bc-ad)g^2x}{85d^2} + \frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2} - \frac{B^2(bc-}{}$$

$$= -\frac{AbB(bc-ad)g^2x}{85d^2} + \frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2} - \frac{B^2(bc-}{}$$

$$= -\frac{AbB(bc-ad)g^2x}{85d^2} + \frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2} - \frac{B^2(bc-}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1514 vs. 2(536) = 1072.
time = 1.07, size = 1514, normalized size = 2.82

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x),x]
```

```
[Out] (g^2*(-2*A^2*b*d*(b*c - 2*a*d)*x + A^2*b^2*d^2*x^2 + 2*A^2*(b*c - a*d)^2*Lo
g[c + d*x] + 2*A*B*(-2*b^2*c^2 + 2*a*b*c*d - b^2*c*d*x + a*b*d^2*x + 2*b^2*
c^2*Log[c/d + x] - b^2*c^2*Log[c/d + x]^2 - a^2*d^2*Log[a + b*x] - 2*b^2*c*
d*x*Log[(e*(a + b*x))/(c + d*x)] + b^2*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)]
 + b^2*c^2*Log[c + d*x] + 2*b^2*c^2*Log[c/d + x]*Log[c + d*x] + 2*b^2*c^2*L
og[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 2*b*c*Log[a/b + x]*(a*d + b*c*Lo
g[c + d*x] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*b^2*c^2*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)]) - 2*a^2*A*B*d^2*(Log[c/d + x]^2 + 2*(Log[a/b +
x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b
 + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a
*d)])) - 4*a*A*B*d*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c + d*x)*(-1
+ Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/d + x] - L
og[(e*(a + b*x))/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[a/b + x]*L
og[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))
+ 4*a*B^2*d*(d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2 + b*c*Log[(e*(a + b
*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*c -
a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(e*(a + b*
x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)]) + 2*b*c*(Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b
*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) + B^2*(2*d*
(-(b*c) + a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 2*a^2*d^2*Log[a + b
*x]*Log[(e*(a + b*x))/(c + d*x)] + b^2*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)]
^2 - 2*b*c*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2 + 2*(b*c - a*d)^2*Log
[c + d*x] - 2*b^2*c^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b
*d*x)] - 2*b^2*c^2*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*
d*x)] + a^2*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*
d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b^2*c^2*(Log[(b*c - a*
d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b
*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(b*c - a*d
)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*
Log[(e*(a + b*x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)]) - 4*b^2*c^2*(Log[(e*(a + b*x))/(c + d*x)]*Po
lyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*
x))])) - 2*a^2*B^2*d^2*(Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c
```

```
 + b*d*x)] + 2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))] - 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(2*d^3*i)
```

Maple [F]
time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^2 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] 2*A^2*a*b*g^2*(-I*x/d + I*c*log(d*x + c)/d^2) - 1/2*A^2*b^2*g^2*(2*I*c^2*lo
g(d*x + c)/d^3 + I*(d*x^2 - 2*c*x)/d^2) - I*A^2*a^2*g^2*log(I*d*x + I*c)/d
+ 1/6*(2*(-I*b^2*c^2*g^2 + 2*I*a*b*c*d*g^2 - I*a^2*d^2*g^2)*B^2*log(d*x + c
)^3 + 3*(-I*B^2*b^2*d^2*g^2*x^2 + 2*(I*b^2*c*d*g^2 - 2*I*a*b*d^2*g^2)*B^2*x
)*log(d*x + c)^2)/d^3 + integrate((-2*I*A*B*a^2*d*g^2 - I*B^2*a^2*d*g^2 + (
-2*I*A*B*b^2*d*g^2 - I*B^2*b^2*d*g^2)*x^2 + (-I*B^2*b^2*d*g^2*x^2 - 2*I*B^2
*a*b*d*g^2*x - I*B^2*a^2*d*g^2)*log(b*x + a)^2 - 2*(2*I*A*B*a*b*d*g^2 + I*B
^2*a*b*d*g^2)*x - 2*(I*A*B*a^2*d*g^2 + I*B^2*a^2*d*g^2 + (I*A*B*b^2*d*g^2 +
 I*B^2*b^2*d*g^2)*x^2 + 2*(I*A*B*a*b*d*g^2 + I*B^2*a*b*d*g^2)*x)*log(b*x +
a) + (2*I*A*B*a^2*d*g^2 + 2*I*B^2*a^2*d*g^2 + (2*I*A*B*b^2*d*g^2 + 3*I*B^2*
b^2*d*g^2)*x^2 - 2*(-2*I*A*B*a*b*d*g^2 + (I*b^2*c*g^2 - 4*I*a*b*d*g^2)*B^2)
*x - 2*(-I*B^2*b^2*d*g^2*x^2 - 2*I*B^2*a*b*d*g^2*x - I*B^2*a^2*d*g^2)*log(b
*x + a))*log(d*x + c))/(d^2*x + c*d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] integral((-I*A^2*b^2*g^2*x^2 - 2*I*A^2*a*b*g^2*x - I*A^2*a^2*g^2 + (-I*B^2*
b^2*g^2*x^2 - 2*I*B^2*a*b*g^2*x - I*B^2*a^2*g^2)*log((b*x + a)*e/(d*x + c))
^2 - 2*(I*A*B*b^2*g^2*x^2 + 2*I*A*B*a*b*g^2*x + I*A*B*a^2*g^2)*log((b*x + a
)*e/(d*x + c)))/(d*x + c), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(I*d*x + I*c
), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x),
x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x),
 x)
```

3.86 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=283

$$\frac{2B(bc-ad)g\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2i}+\frac{g(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{di}+\frac{(bc-ad)g\log\left(\frac{bc-a}{b(c+d}\right.}{}$$

[Out] 2*B*(-a*d+b*c)*g*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^2/i +g*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d/i+(-a*d+b*c)*g*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^2/i+2*B^2*(-a*d+b*c)*g*polylog(2,d* (b*x+a)/b/(d*x+c))/d^2/i+2*B*(-a*d+b*c)*g*(A+B*ln(e*(b*x+a)/(d*x+c)))*polyl og(2,d*(b*x+a)/b/(d*x+c))/d^2/i-2*B^2*(-a*d+b*c)*g*polylog(3,d*(b*x+a)/b/(d *x+c))/d^2/i

Rubi [A]
time = 0.22, antiderivative size = 283, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$, Rules used = {2562, 2395, 2355, 2354, 2438, 2421, 6724}

$$\frac{2Bg(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i}+\frac{2B^2g(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}-\frac{2B^2g(bc-ad)\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}+\frac{2Bg(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i}+\frac{g(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^2i}+\frac{g(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{di}$$

Antiderivative was successfully verified.

[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x),x]

[Out] (2*B*(b*c - a*d)*g*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/ (c + d*x)]))/(d^2*i) + (g*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2) /(d*i) + ((b*c - a*d)*g*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b *x))/(c + d*x)])^2)/(d^2*i) + (2*B^2*(b*c - a*d)*g*PolyLog[2, (d*(a + b*x)) /(b*(c + d*x))])/(d^2*i) + (2*B*(b*c - a*d)*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i) - (2*B^2*(b*c - a* d)*g*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i)

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
```

```
, p}, x] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86c+86dx}\,dx=\int\left(\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d}+\frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{86d(c+dx)}\right.$$

$$=\frac{(bg)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx}{86d}-\frac{((bc-ad)g)\int\frac{\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{c+dx}}{86d}$$

$$=\frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d}-\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d^2}$$

$$=\frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d}-\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d^2}$$

$$=\frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d}-\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d^2}$$

$$=\frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d}-\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d^2}$$

$$=\frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d}+\frac{bgx\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{86d}$$

$$=\frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d}+\frac{bgx\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{86d}$$

$$=\frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d}+\frac{bgx\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{86d}$$

$$=\frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d}+\frac{bgx\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{86d}$$

$$=\frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d}+\frac{bgx\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{86d}$$

$$=-\frac{aB^2g\log^2(a+bx)}{86d}+\frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d}+$$

$$=-\frac{aB^2g\log^2(a+bx)}{86d}+\frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d}+$$

$$=-\frac{aB^2g\log^2(a+bx)}{86d}+\frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d}+$$

$$=-\frac{aB^2g\log^2(a+bx)}{86d}+\frac{B^2(bc-ad)g\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{86d^2}+\frac{a}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 646 vs. 2(283) = 566.
time = 0.43, size = 646, normalized size = 2.28

$$-\frac{g\left(-A^2bdx+A^2(bc-ad)\log(c+dx)+aABd\left(\log^2\left(\frac{c}{d}+x\right)+2\left(\log\left(\frac{a}{b}+x\right)-\log\left(\frac{c}{d}+x\right)-\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)-2\left(\log\left(\frac{a}{b}+x\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)+\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)+AB\left(-2d(a+bx)\left(-1+\log\left(\frac{a}{b}+x\right)\right)+2b(c+dx)\left(-1+\log\left(\frac{c}{d}+x\right)\right)-bc\log^2\left(\frac{c}{d}+x\right)+2b\left(\log\left(\frac{a}{b}+x\right)-\log\left(\frac{c}{d}+x\right)-\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\left(dx-c\log(c+dx)\right)+2bc\left(\log\left(\frac{a}{b}+x\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)+\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)-B^2\left(d(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)+bc\log^2\left(\frac{e(a+bx)}{c+dx}\right)\log\left(\frac{bc-ad}{bc+bdx}\right)-(bc-ad)\left(\log\left(\frac{bc-ad}{bc+bdx}\right)\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-2\log\left(\frac{e(a+bx)}{c+dx}\right)+\log\left(\frac{bc-ad}{bc+bdx}\right)\right)-2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2bc\left(\log\left(\frac{e(a+bx)}{c+dx}\right)\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)-\text{Li}_3\left(\frac{d(a+bx)}{b(c+dx)}\right)\right)\right)+aB^2d\left(\log^2\left(\frac{e(a+bx)}{c+dx}\right)\log\left(\frac{bc-ad}{bc+bdx}\right)+2\log\left(\frac{e(a+bx)}{c+dx}\right)\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)-2\text{Li}_3\left(\frac{d(a+bx)}{b(c+dx)}\right)\right)\right)}{d^2i}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i
*x),x]
```

```
[Out] -((g*(-(A^2*b*d*x) + A^2*(b*c - a*d)*Log[c + d*x] + a*A*B*d*(Log[c/d + x]^2
 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d
*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)])) + A*B*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c +
 d*x)*(-1 + Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/
d + x] - Log[(e*(a + b*x))/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[
a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c)
+ a*d)])) - B^2*(d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2 + b*c*Log[(e*(a
 + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*
c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(e*(a
+ b*x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)]) + 2*b*c*(Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a
 + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) + a*B^2
*d*(Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*Log[(
e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 2*PolyLog
[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^2*i))
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorit
hm="maxima")
```

```
[Out] A^2*b*g*(-I*x/d + I*c*log(d*x + c)/d^2) - I*A^2*a*g*log(I*d*x + I*c)/d - 1/
3*(3*I*B^2*b*d*g*x*log(d*x + c)^2 + (-I*b*c*g + I*a*d*g)*B^2*log(d*x + c)^3
)/d^2 + integrate((-2*I*A*B*a*g - I*B^2*a*g + (-I*B^2*b*g*x - I*B^2*a*g)*lo
g(b*x + a)^2 + (-2*I*A*B*b*g - I*B^2*b*g)*x - 2*(I*A*B*a*g + I*B^2*a*g + (I
*A*B*b*g + I*B^2*b*g)*x)*log(b*x + a) - 2*(-I*A*B*a*g - I*B^2*a*g + (-I*A*B
*b*g - 2*I*B^2*b*g)*x + (-I*B^2*b*g*x - I*B^2*a*g)*log(b*x + a))*log(d*x +
c))/(d*x + c), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] integral((-I*A^2*b*g*x - I*A^2*a*g + (-I*B^2*b*g*x - I*B^2*a*g)*log((b*x +
a)*e/(d*x + c))^2 - 2*(I*A*B*b*g*x + I*A*B*a*g)*log((b*x + a)*e/(d*x + c)))
/(d*x + c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g\left(\int \frac{A^2a}{c+dx}\,dx + \int \frac{A^2bx}{c+dx}\,dx + \int \frac{B^2a\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)^2}{c+dx}\,dx + \int \frac{2ABa\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx + \int \frac{B^2bx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)^2}{c+dx}\,dx + \int \frac{2ABbx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] g*(Integral(A**2*a/(c + d*x), x) + Integral(A**2*b*x/(c + d*x), x) + Integr
al(B**2*a*log(a*e/(c + d*x) + b*e*x/(c + d*x))**2/(c + d*x), x) + Integral(
2*A*B*a*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(c + d*x), x) + Integral(B**2*
b*x*log(a*e/(c + d*x) + b*e*x/(c + d*x))**2/(c + d*x), x) + Integral(2*A*B*
b*x*log(a*e/(c + d*x) + b*e*x/(c + d*x))/(c + d*x), x))/i
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(I*d*x + I*c),
 x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x),x)
```

```
[Out] int(((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x), x
)
```

3.87 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=127

$$-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{di}-\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)}{di}+\frac{2B^2\text{Li}_3\left(\frac{d(a+bx)}{b(c+dx)}\right)}{di}$$

```
[Out] -ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d/i-2*B*(A+B*ln(e*(
b*x+a)/(d*x+c)))*polylog(2,d*(b*x+a)/b/(d*x+c))/d/i+2*B^2*polylog(3,d*(b*x+
a)/b/(d*x+c))/d/i
```

Rubi [A]
time = 0.08, antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2552, 2354, 2421, 6724}

$$-\frac{2B\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{di}+\frac{2B^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{di}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{di}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x),x]
```

```
[Out] -((Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(
d*i)) - (2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/
(b*(c + d*x))])/(d*i) + (2*B^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d*
i)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2552

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(
```

```
m + 1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a
 + b*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && EqQ[n
 + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d, 0] && IntegersQ[m, p] && EqQ[d*f
- c*g, 0] && (GtQ[p, 0] || LtQ[m, -1])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{87c+87dx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+\right.}{e(a+}}{87d}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+\right.}{a+}}{87de}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B)\int \frac{(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\mathrm{lo}}{(a+bx)(c+dx)}}{87de}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{(a+bx)(c}}{87d}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B(bc-ad))\int \left(\frac{d\left(-A-B\log\left(\frac{e(a}{c+}\right.\right.}{(bc-a}\right.}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{1}{87}(2B)\int \frac{\left(-A-B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{c+}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{1}{87}(2B)\int \left(\frac{A\log(87c+87dx)}{-c-dx}\right.$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{1}{87}(2AB)\int \frac{\log(87c+87dx)}{-c-dx}\,dx$$

$$= -\frac{2AB\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(87c+87dx)}{87d} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+}{87d}$$

$$= -\frac{2AB\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(87c+87dx)}{87d} + \frac{2B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\left(\log(a+bx)-\right.}{}$$

$$= -\frac{B^2\log^2(a+bx)\log(87(c+dx))}{87d} - \frac{2B^2\log(a+bx)\log\left(\frac{1}{c+dx}\right)\log(87(c+d}{87d}$$

$$= -\frac{B^2\log^2(a+bx)\log(87(c+dx))}{87d} - \frac{2B^2\log(a+bx)\log\left(\frac{1}{c+dx}\right)\log(87(c+d}{87d}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{87d} - \frac{B^2\log^2(a+bx)\log(87(c+dx))}{87d} - \frac{2B^2\log(a}{}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{87d} + \frac{B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log^2\left(\frac{1}{c+dx}\right)}{87d} - \frac{B^2\log^2(a+}{}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{87d} + \frac{B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log^2\left(\frac{1}{c+dx}\right)}{87d} - \frac{B^2\log^2(a+}{}$$

Mathematica [A]
time = 0.10, size = 251, normalized size = 1.98

$$\frac{-AB\log^2\left(\frac{c}{d}+x\right)+A^2\log(c+dx)-2AB\log\left(\frac{a}{b}+x\right)\log(c+dx)+2AB\log\left(\frac{c}{d}+x\right)\log(c+dx)+2AB\log\left(\frac{e(a+bx)}{c+dx}\right)\log(c+dx)+2AB\log\left(\frac{a}{b}+x\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)-B^2\log^2\left(\frac{e(a+bx)}{c+dx}\right)\log\left(\frac{bc-ad}{bc+bdx}\right)+2AB\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)-2B^2\log\left(\frac{e(a+bx)}{c+dx}\right)\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)+2B^2\text{Li}_3\left(\frac{d(a+bx)}{b(c+dx)}\right)}{di}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x),x]
```

```
[Out] (-(A*B*Log[c/d + x]^2) + A^2*Log[c + d*x] - 2*A*B*Log[a/b + x]*Log[c + d*x]
 + 2*A*B*Log[c/d + x]*Log[c + d*x] + 2*A*B*Log[(e*(a + b*x))/(c + d*x)]*Log
[c + d*x] + 2*A*B*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] - B^2*Log[(e*
(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*A*B*PolyLog[2, (
d*(a + b*x))/(-(b*c) + a*d)] - 2*B^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2
, (d*(a + b*x))/(b*(c + d*x))] + 2*B^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x
))])/(d*i)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 463 vs. $2(127) = 254$.
time = 1.37, size = 464, normalized size = 3.65

method	result
risch	$\frac{A^2\ln(dx+c)}{id}-\frac{B^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2\ln\left(1-\frac{d\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{be}\right)}{di}-\frac{2B^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\text{polylog}\left(2,\frac{d\left(\frac{be}{d}+\frac{(ad-c\ldots}{\ldots}\right.}{be}\right.}{di}$
derivativedivides	$-\frac{e(ad-cb)\left(\frac{dA^2\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{ie(ad-cb)}+\frac{dB^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2\ln\left(1-\frac{d\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{be}\right)}{ie(ad-cb)}+\frac{2dB^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right.}{}\right.}{}$
default	$-\frac{e(ad-cb)\left(\frac{dA^2\ln\left(be-\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)d\right)}{ie(ad-cb)}+\frac{dB^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2\ln\left(1-\frac{d\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{be}\right)}{ie(ad-cb)}+\frac{2dB^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right.}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(d/i/e/(a*d-b*c)*A^2*ln(b*e-(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*d)+d/i/e/(a*d-b*c)*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(1-1/b/e*d*(b*
e/d+(a*d-b*c)*e/d/(d*x+c)))+2*d/i/e/(a*d-b*c)*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*polylog(2,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))-2*d/i/e/(a*d-b*c)*B
^2*polylog(3,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))+2*d/i/e/(a*d-b*c)*A*B*d
ilog(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)/b/e)+2*d/i/e/(a*d-b*c)*A*B*ln(
```

```
b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(-b*e+(b*e/d+(a*d-b*c)*e/d/(d*x+c))*d)/b/e
))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="maxima")
[Out] -1/3*I*B^2*log(d*x + c)^3/d - I*A^2*log(I*d*x + I*c)/d + integrate((-I*B^2*
log(b*x + a)^2 - 2*I*A*B - I*B^2 - 2*(I*A*B + I*B^2)*log(b*x + a) - 2*(-I*B
^2*log(b*x + a) - I*A*B - I*B^2)*log(d*x + c))/(d*x + c), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="fricas")
[Out] integral((-I*B^2*log((b*x + a)*e/(d*x + c))^2 - 2*I*A*B*log((b*x + a)*e/(d*
x + c)) - I*A^2)/(d*x + c), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^2}{c+dx}\,dx + \int \frac{B^2\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)^2}{c+dx}\,dx + \int \frac{2AB\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{c+dx}\,dx}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
[Out] (Integral(A**2/(c + d*x), x) + Integral(B**2*log(a*e/(c + d*x) + b*e*x/(c +
 d*x))**2/(c + d*x), x) + Integral(2*A*B*log(a*e/(c + d*x) + b*e*x/(c + d*x
))/(c + d*x), x))/i
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(I*d*x + I*c), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)^2}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(c*i + d*i*x),x)
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(c*i + d*i*x), x)
```

3.88 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)}\,dx$

Optimal. Leaf size=44

$$\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^3}{3B(bc-ad)gi}$$

```
[Out] 1/3*(A+B*ln(e*(b*x+a)/(d*x+c)))^3/B/(-a*d+b*c)/g/i
```

Rubi [A]
time = 0.10, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {2562, 2339, 30}

$$\frac{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bgi(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x))/(c + d*x)])^3/(3*B*(b*c - a*d)*g*i)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(88c+88dx)(ag+bgx)}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g(c+dx)}\right) dx$$

$$= \frac{b\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{88(bc-ad)g} - \frac{d\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{88(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} -$$

$$= -\frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} + \frac{\log(}{}$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\,\mathrm{lo}}{88(bc-}$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\,\mathrm{lo}}{88(bc-}$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\,\mathrm{lo}}{88(bc-}$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\,\mathrm{lo}}{88(bc-}$$

Mathematica [A]
time = 0.13, size = 79, normalized size = 1.80

$$\frac{3A^2\log\left(\frac{e(a+bx)}{c+dx}\right)+3AB\log^2\left(\frac{e(a+bx)}{c+dx}\right)+B^2\log^3\left(\frac{e(a+bx)}{c+dx}\right)}{3bcgi-3adgi}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*x)),x]
```

```
[Out] (3*A^2*Log[(e*(a + b*x))/(c + d*x)] + 3*A*B*Log[(e*(a + b*x))/(c + d*x)]^2 + B^2*Log[(e*(a + b*x))/(c + d*x)]^3)/(3*b*c*g*i - 3*a*d*g*i)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 181 vs. $2(42) = 84$.
time = 0.60, size = 182, normalized size = 4.14

method	result	size
norman	$-\frac{B^2\ln\left(\frac{e(bx+a)}{dx+c}\right)^3}{3gi(ad-cb)}-\frac{A^2\ln\left(\frac{e(bx+a)}{dx+c}\right)}{gi(ad-cb)}-\frac{AB\ln\left(\frac{e(bx+a)}{dx+c}\right)^2}{gi(ad-cb)}$	113
risch	$\frac{A^2\ln(dx+c)}{gi(ad-cb)}-\frac{A^2\ln(bx+a)}{gi(ad-cb)}-\frac{B^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}{3gi(ad-cb)}-\frac{AB\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{gi(ad-cb)}$	156
derivativedivides	$-\frac{e(ad-cb)\left(\frac{d^2A^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{ei(ad-cb)^2g}+\frac{d^2AB\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{ei(ad-cb)^2g}+\frac{d^2B^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}{3ei(ad-cb)^2g}\right)}{d^2}$	182
default	$-\frac{e(ad-cb)\left(\frac{d^2A^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{ei(ad-cb)^2g}+\frac{d^2AB\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{ei(ad-cb)^2g}+\frac{d^2B^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^3}{3ei(ad-cb)^2g}\right)}{d^2}$	182

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(d^2/e/i/(a*d-b*c)^2/g*A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d^2/e/i/(a*d-b*c)^2/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+1/3*d^2/e/i/(a*d-b*c)^2/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 395 vs. $2(40) = 80$.
time = 0.29, size = 395, normalized size = 8.98

$$-B^2\left(\frac{\log(bx+a)}{(-i\,bc+i\,ad)g}-\frac{\log(dx+c)}{(-i\,bc+i\,ad)g}\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)^2-2\,AB\left(\frac{\log(bx+a)}{(-i\,bc+i\,ad)g}-\frac{\log(dx+c)}{(-i\,bc+i\,ad)g}\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)+\frac{1}{3}B^2\left(\frac{3\left(i\log(bx+a)^2-2i\log(bx+a)\log(dx+c)+i\log(dx+c)^2\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)}{bcg-adg}+\frac{-i\log(bx+a)^3+3i\log(bx+a)^2\log(dx+c)-3i\log(bx+a)\log(dx+c)^2+i\log(dx+c)^3}{bcg-adg}\right)-A^2\left(\frac{\log(bx+a)}{(-i\,bc+i\,ad)g}-\frac{\log(dx+c)}{(-i\,bc+i\,ad)g}\right)+\frac{\left(i\log(bx+a)^2-2i\log(bx+a)\log(dx+c)+i\log(dx+c)^2\right)AB}{bcg-adg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i),x, algorit
hm="maxima")
```

```
[Out] -B^2*(log(b*x + a)/((-I*b*c + I*a*d)*g) - log(d*x + c)/((-I*b*c + I*a*d)*g)
)*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2 - 2*A*B*(log(b*x + a)/((-I*b*c + I
*a*d)*g) - log(d*x + c)/((-I*b*c + I*a*d)*g))*log(b*x*e/(d*x + c) + a*e/(d*
x + c)) + 1/3*B^2*(3*(I*log(b*x + a)^2 - 2*I*log(b*x + a)*log(d*x + c) + I*
log(d*x + c)^2)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(b*c*g - a*d*g) + (-I*
log(b*x + a)^3 + 3*I*log(b*x + a)^2*log(d*x + c) - 3*I*log(b*x + a)*log(d*x
 + c)^2 + I*log(d*x + c)^3)/(b*c*g - a*d*g)) - A^2*(log(b*x + a)/((-I*b*c +
 I*a*d)*g) - log(d*x + c)/((-I*b*c + I*a*d)*g)) + (I*log(b*x + a)^2 - 2*I*l
og(b*x + a)*log(d*x + c) + I*log(d*x + c)^2)*A*B/(b*c*g - a*d*g)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 82 vs. $2(40) = 80$.
time = 0.42, size = 82, normalized size = 1.86

$$-\frac{i\,B^2\log\left(\frac{(bx+a)e}{dx+c}\right)^3+3i\,AB\log\left(\frac{(bx+a)e}{dx+c}\right)^2+3i\,A^2\log\left(\frac{(bx+a)e}{dx+c}\right)}{3\,(bc-ad)g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] -1/3*(I*B^2*log((b*x + a)*e/(d*x + c))^3 + 3*I*A*B*log((b*x + a)*e/(d*x + c
))^2 + 3*I*A^2*log((b*x + a)*e/(d*x + c)))/((b*c - a*d)*g)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 206 vs. $2(31) = 62$.
time = 0.41, size = 206, normalized size = 4.68

$$A^2\left(\frac{\log\left(x+\frac{-\frac{a^2d^2}{ad-bc}+\frac{2abcd}{ad-bc}+ad-\frac{b^2c^2}{ad-bc}+bc}{2bd}\right)}{gi\,(ad-bc)}-\frac{\log\left(x+\frac{\frac{a^2d^2}{ad-bc}-\frac{2abcd}{ad-bc}+ad+\frac{b^2c^2}{ad-bc}+bc}{2bd}\right)}{gi\,(ad-bc)}\right)-\frac{AB\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{adgi-bcgi}-\frac{B^2\log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3adgi-3bcgi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] A**2*(log(x + (-a**2*d**2/(a*d - b*c) + 2*a*b*c*d/(a*d - b*c) + a*d - b**2*
c**2/(a*d - b*c) + b*c)/(2*b*d))/(g*i*(a*d - b*c)) - log(x + (a**2*d**2/(a*
d - b*c) - 2*a*b*c*d/(a*d - b*c) + a*d + b**2*c**2/(a*d - b*c) + b*c)/(2*b*
d))/(g*i*(a*d - b*c))) - A*B*log(e*(a + b*x)/(c + d*x))**2/(a*d*g*i - b*c*g
*i) - B**2*log(e*(a + b*x)/(c + d*x))**3/(3*a*d*g*i - 3*b*c*g*i)
```

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 143 vs. $2(40) = 80$.

time = 3.48, size = 143, normalized size = 3.25

$$-\frac{\left(i\,B^{2}e\log\left(\frac{bxe+ae}{dx+c}\right)^{3}+3i\,ABe\log\left(\frac{bxe+ae}{dx+c}\right)^{2}+3i\,A^{2}e\log\left(\frac{bxe+ae}{dx+c}\right)\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{3\,g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] -1/3*(I*B^2*e*log((b*x*e + a*e)/(d*x + c))^3 + 3*I*A*B*e*log((b*x*e + a*e)/
(d*x + c))^2 + 3*I*A^2*e*log((b*x*e + a*e)/(d*x + c)))*(b*c/((b*c*e - a*d*e
)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/g
```

Mupad [B]
time = 5.76, size = 96, normalized size = 2.18

$$-\frac{-6\mathrm{i}\,\mathrm{atan}\left(\frac{a\,d\,1\mathrm{i}+b\,c\,1\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}\right)\,A^{2}+3\,A\,B\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^{2}+B^{2}\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^{3}}{3\,g\,i\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)*(c*i + d*i*x)),x)
```

```
[Out] -(B^2*log((e*(a + b*x))/(c + d*x))^3 - A^2*atan((a*d*1i + b*c*1i + b*d*x*2i
)/(a*d - b*c))*6i + 3*A*B*log((e*(a + b*x))/(c + d*x))^2)/(3*g*i*(a*d - b*c
))
```

3.89 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)}\,dx$

Optimal. Leaf size=183

$$-\frac{2bB^2(c+dx)}{(bc-ad)^2g^2i(a+bx)}-\frac{2bB(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2g^2i(a+bx)}-\frac{b(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(bc-ad)^2g^2i(a+bx)}-\frac{d\left(A+\right.}{3B(}$$

```
[Out] -2*b*B^2*(d*x+c)/(-a*d+b*c)^2/g^2/i/(b*x+a)-2*b*B*(d*x+c)*(A+B*ln(e*(b*x+a)
/(d*x+c)))/(-a*d+b*c)^2/g^2/i/(b*x+a)-b*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))
^2/(-a*d+b*c)^2/g^2/i/(b*x+a)-1/3*d*(A+B*ln(e*(b*x+a)/(d*x+c)))^3/B/(-a*d+b
*c)^2/g^2/i
```

Rubi [A]
time = 0.19, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2562, 2395, 2342, 2341, 2339, 30}

$$-\frac{d\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bg^2i(bc-ad)^2}-\frac{b(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2i(a+bx)(bc-ad)^2}-\frac{2bB(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i(a+bx)(bc-ad)^2}-\frac{2bB^2(c+dx)}{g^2i(a+bx)(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*i*x)),
x]
```

```
[Out] (-2*b*B^2*(c + d*x))/((b*c - a*d)^2*g^2*i*(a + b*x)) - (2*b*B*(c + d*x)*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g^2*i*(a + b*x)) - (b*(c
+ d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^2*g^2*i*(a + b*
x)) - (d*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^2*g^2*i)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
```

```
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(89c+89dx)(ag+bgx)^2}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2(a+bx)} + \frac{d^2\left(A+B\right.}{89(bc-a}\right.$$

$$= -\frac{(bd)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{89(bc-ad)^2g^2} + \frac{d^2\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{89(bc-ad)^2g^2} + \frac{b\int \frac{\left(A+B\log\left(\right.\right.}{(a+}}{89(bc-}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2} + \frac{d\left(A\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2} + \frac{d\left(A\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2} + \frac{d\left(A\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2} + \frac{d\left(A\right.}{}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)g^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)^2g^2} -$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)g^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)^2g^2} -$$

$$= \frac{B^2d\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{89(bc-ad)^2g^2} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)g^2(a+bx)} - \frac{2Bd\log(a}{}$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\right.}{89(bc-ad)^2g^2}$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d}{}$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d}{89(}$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d}{89(}$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d}{89(}$$

Mathematica [A]
time = 0.36, size = 186, normalized size = 1.02

$$-\frac{3(A^2+2AB+2B^2)\,d(a+bx)\log(a+bx)+6B(A+B)(bc-ad)\log\left(\frac{e(a+bx)}{c+dx}\right)+3B(aAd+Abdx+bB(c+dx))\log^2\left(\frac{e(a+bx)}{c+dx}\right)+B^2d(a+bx)\log^3\left(\frac{e(a+bx)}{c+dx}\right)+3(A^2+2AB+2B^2)\,(bc-ad-d(a+bx)\log(c+dx))}{3(bc-ad)^2g^2i(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*
i*x)),x]
```

```
[Out] -1/3*(3*(A^2 + 2*A*B + 2*B^2)*d*(a + b*x)*Log[a + b*x] + 6*B*(A + B)*(b*c -
 a*d)*Log[(e*(a + b*x))/(c + d*x)] + 3*B*(a*A*d + A*b*d*x + b*B*(c + d*x))*
Log[(e*(a + b*x))/(c + d*x)]^2 + B^2*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x
)]^3 + 3*(A^2 + 2*A*B + 2*B^2)*(b*c - a*d - d*(a + b*x)*Log[c + d*x]))/((b*
c - a*d)^2*g^2*i*(a + b*x))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 526 vs. $2(181) = 362$.
time = 0.58, size = 527, normalized size = 2.88 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(d^2/i/(a*d-b*c)^3/g^2*A^2*b/(b*e/d+(a*d-b*c)*e/d/(d*x+c
))+d^3/e/i/(a*d-b*c)^3/g^2*A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2*d^2/i/(a*d
-b*c)^3/g^2*A*B*b*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))+d^3/e/i/(a*d-b*c)^3/g^2*A*B*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))^2-d^2/i/(a*d-b*c)^3/g^2*B^2*b*(-1/(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2/(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))+1/3
*d^3/e/i/(a*d-b*c)^3/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1020 vs. $2(172) = 344$.
time = 0.43, size = 1020, normalized size = 5.57

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] B^2*(1/((-I*b^2*c + I*a*b*d)*g^2*x + (-I*a*b*c + I*a^2*d)*g^2) - d*log(b*x
+ a)/((I*b^2*c^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2) + d*log(d*x + c)/((I*b^2*c
^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2))*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2
+ 2*A*B*(1/((-I*b^2*c + I*a*b*d)*g^2*x + (-I*a*b*c + I*a^2*d)*g^2) - d*log(
```

```
b*x + a)/((I*b^2*c^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2) + d*log(d*x + c)/((I*b
^2*c^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2))*log(b*x*e/(d*x + c) + a*e/(d*x + c)
) - 1/3*B^2*(3*((I*b*d*x + I*a*d)*log(b*x + a)^2 + (I*b*d*x + I*a*d)*log(d*
x + c)^2 - 2*I*b*c + 2*I*a*d - 2*(I*b*d*x + I*a*d)*log(b*x + a) - 2*(-I*b*d
*x - I*a*d + (I*b*d*x + I*a*d)*log(b*x + a))*log(d*x + c))*log(b*x*e/(d*x +
 c) + a*e/(d*x + c))/(a*b^2*c^2*g^2 - 2*a^2*b*c*d*g^2 + a^3*d^2*g^2 + (b^3*
c^2*g^2 - 2*a*b^2*c*d*g^2 + a^2*b*d^2*g^2)*x) + ((-I*b*d*x - I*a*d)*log(b*x
 + a)^3 + (I*b*d*x + I*a*d)*log(d*x + c)^3 - 3*(-I*b*d*x - I*a*d)*log(b*x +
 a)^2 - 3*(-I*b*d*x - I*a*d + (I*b*d*x + I*a*d)*log(b*x + a))*log(d*x + c)^
2 - 6*I*b*c + 6*I*a*d - 6*(I*b*d*x + I*a*d)*log(b*x + a) - 3*(-2*I*b*d*x +
(-I*b*d*x - I*a*d)*log(b*x + a)^2 - 2*I*a*d + 2*(I*b*d*x + I*a*d)*log(b*x +
 a))*log(d*x + c))/(a*b^2*c^2*g^2 - 2*a^2*b*c*d*g^2 + a^3*d^2*g^2 + (b^3*c^
2*g^2 - 2*a*b^2*c*d*g^2 + a^2*b*d^2*g^2)*x)) + A^2*(1/((-I*b^2*c + I*a*b*d)
*g^2*x + (-I*a*b*c + I*a^2*d)*g^2) - d*log(b*x + a)/((I*b^2*c^2 - 2*I*a*b*c
*d + I*a^2*d^2)*g^2) + d*log(d*x + c)/((I*b^2*c^2 - 2*I*a*b*c*d + I*a^2*d^2
)*g^2)) - ((I*b*d*x + I*a*d)*log(b*x + a)^2 + (I*b*d*x + I*a*d)*log(d*x + c
)^2 - 2*I*b*c + 2*I*a*d - 2*(I*b*d*x + I*a*d)*log(b*x + a) - 2*(-I*b*d*x -
I*a*d + (I*b*d*x + I*a*d)*log(b*x + a))*log(d*x + c))*A*B/(a*b^2*c^2*g^2 -
2*a^2*b*c*d*g^2 + a^3*d^2*g^2 + (b^3*c^2*g^2 - 2*a*b^2*c*d*g^2 + a^2*b*d^2*
g^2)*x)
```

Fricas [**A**]
time = 0.38, size = 243, normalized size = 1.33

$$\frac{(i\,B^2bdx+i\,B^2ad)\log\left(\frac{(bx+a)e}{dx+c}\right)^3-3\,(-i\,A^2-2i\,AB-2i\,B^2)bc-3\,(i\,A^2+2i\,AB+2i\,B^2)ad-3\,(-i\,B^2bc-i\,ABad+(-i\,AB-i\,B^2)bdx)\log\left(\frac{(bx+a)e}{dx+c}\right)^2-3\,(-i\,A^2ad+(-i\,A^2-2i\,AB-2i\,B^2)bdx+2\,(-i\,AB-i\,B^2)bc)\log\left(\frac{(bx+a)e}{dx+c}\right)}{3\,((b^3c^2-2\,ab^2cd+a^2bd^2)g^2x+(ab^2c^2-2\,a^2bcd+a^3d^2)g^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] 1/3*((I*B^2*b*d*x + I*B^2*a*d)*log((b*x + a)*e/(d*x + c))^3 - 3*(-I*A^2 - 2
*I*A*B - 2*I*B^2)*b*c - 3*(I*A^2 + 2*I*A*B + 2*I*B^2)*a*d - 3*(-I*B^2*b*c -
 I*A*B*a*d + (-I*A*B - I*B^2)*b*d*x)*log((b*x + a)*e/(d*x + c))^2 - 3*(-I*A
^2*a*d + (-I*A^2 - 2*I*A*B - 2*I*B^2)*b*d*x + 2*(-I*A*B - I*B^2)*b*c)*log((
b*x + a)*e/(d*x + c)))/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^2*x + (a*b^2*
c^2 - 2*a^2*b*c*d + a^3*d^2)*g^2)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 541 vs. $2(158) = 316$.
time = 0.94, size = 541, normalized size = 2.96

$$-\frac{B^2d\log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3a^2d^2g^2i-6abcdg^2i+3b^2c^2g^2i}+\frac{(2AB+2B^2)\log\left(\frac{e(a+bx)}{c+dx}\right)}{a^2dg^2i-abcg^2i+abdg^2ix-b^2cg^2ix}+(A^2+2AB+2B^2)\left(\frac{d\log\left(x+\frac{-\frac{a^3d^4}{(ad-bc)^2}+\frac{3a^2bcd^3}{(ad-bc)^2}-\frac{3ab^2c^2d^2}{(ad-bc)^2}+ad^2+\frac{b^3c^3d}{(ad-bc)^2}+bcd}{2bd^2}\right)}{g^2i\,(ad-bc)^2}-\frac{d\log\left(x+\frac{\frac{a^3d^4}{(ad-bc)^2}-\frac{3a^2bcd^3}{(ad-bc)^2}+\frac{3ab^2c^2d^2}{(ad-bc)^2}+ad^2-\frac{b^3c^3d}{(ad-bc)^2}+bcd}{2bd^2}\right)}{g^2i\,(ad-bc)^2}+\frac{1}{a^2dg^2i-abcg^2i+x\,(abdg^2i-b^2cg^2i)}\right)+\frac{(-ABad-ABbdx-B^2bc-B^2bdx)\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{a^3d^2g^2i-2a^2bcdg^2i+a^2bd^2g^2ix+ab^2c^2g^2i-2ab^2cdg^2ix+b^3c^2g^2ix}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2/(d*i*x+c*i),x)
```

```
[Out] -B**2*d*log(e*(a + b*x)/(c + d*x))**3/(3*a**2*d**2*g**2*i - 6*a*b*c*d*g**2*
i + 3*b**2*c**2*g**2*i) + (2*A*B + 2*B**2)*log(e*(a + b*x)/(c + d*x))/(a**2
*d*g**2*i - a*b*c*g**2*i + a*b*d*g**2*i*x - b**2*c*g**2*i*x) + (A**2 + 2*A*
B + 2*B**2)*(d*log(x + (-a**3*d**4/(a*d - b*c)**2 + 3*a**2*b*c*d**3/(a*d -
b*c)**2 - 3*a*b**2*c**2*d**2/(a*d - b*c)**2 + a*d**2 + b**3*c**3*d/(a*d - b
*c)**2 + b*c*d)/(2*b*d**2))/(g**2*i*(a*d - b*c)**2) - d*log(x + (a**3*d**4/
(a*d - b*c)**2 - 3*a**2*b*c*d**3/(a*d - b*c)**2 + 3*a*b**2*c**2*d**2/(a*d -
 b*c)**2 + a*d**2 - b**3*c**3*d/(a*d - b*c)**2 + b*c*d)/(2*b*d**2))/(g**2*i
*(a*d - b*c)**2) + 1/(a**2*d*g**2*i - a*b*c*g**2*i + x*(a*b*d*g**2*i - b**2
*c*g**2*i))) + (-A*B*a*d - A*B*b*d*x - B**2*b*c - B**2*b*d*x)*log(e*(a + b*
x)/(c + d*x))**2/(a**3*d**2*g**2*i - 2*a**2*b*c*d*g**2*i + a**2*b*d**2*g**2
*i*x + a*b**2*c**2*g**2*i - 2*a*b**2*c*d*g**2*i*x + b**3*c**2*g**2*i*x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

$$\text{could not integrate}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^2*(I*d*x + I*
c)), x)
```

Mupad [B]
time = 6.37, size = 419, normalized size = 2.29

$$\frac{A^2+2\,A\,B+2\,B^2}{\left(a\,d-b\,c\right)\,\left(a\,g^2\,i+b\,g^2\,i\,x\right)}-\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)^2\,\left(\frac{B\,d\,\left(A+B\right)}{g^2\,i\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{B^2\,\left(a\,d-b\,c\right)}{b\,d\,g^2\,i\,\left(\frac{x}{d}+\frac{a}{b\,d}\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)-\frac{B^2\,d\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)^3}{3\,g^2\,i\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{2\,B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(a\,d-b\,c\right)\,\left(A+B\right)}{b\,d\,g^2\,i\,\left(\frac{x}{d}+\frac{a}{b\,d}\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}+\frac{d\,\mathrm{atan}\left(\frac{d\,\left(2\,b\,d\,x+\frac{a^2\,d^2\,g^2\,i-b^2\,c^2\,g^2\,i}{g^2\,i\,\left(a\,d-b\,c\right)}\right)\,\left(A^2+2\,A\,B+2\,B^2\right)\,1{}\mathrm{i}}{\left(a\,d-b\,c\right)\,\left(d\,A^2+2\,d\,A\,B+2\,d\,B^2\right)}\right)\,\left(A^2+2\,A\,B+2\,B^2\right)\,2{}\mathrm{i}}{g^2\,i\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)^2*(c*i + d*i*x)),
x)
```

```
[Out] (A^2 + 2*B^2 + 2*A*B)/((a*d - b*c)*(a*g^2*i + b*g^2*i*x)) - log((e*(a + b*x
))/(c + d*x))^2*((B*d*(A + B))/(g^2*i*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (B
^2*(a*d - b*c))/(b*d*g^2*i*(x/d + a/(b*d))*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))
) - (B^2*d*log((e*(a + b*x))/(c + d*x))^3)/(3*g^2*i*(a^2*d^2 + b^2*c^2 - 2*
a*b*c*d)) + (d*atan((d*(2*b*d*x + (a^2*d^2*g^2*i - b^2*c^2*g^2*i)/(g^2*i*(a
*d - b*c)))*(A^2 + 2*B^2 + 2*A*B)*1i)/((a*d - b*c)*(A^2*d + 2*B^2*d + 2*A*B
*d)))*(A^2 + 2*B^2 + 2*A*B)*2i)/(g^2*i*(a*d - b*c)^2) + (2*B*log((e*(a + b*
x))/(c + d*x))*(a*d - b*c)*(A + B))/(b*d*g^2*i*(x/d + a/(b*d))*(a^2*d^2 + b
^2*c^2 - 2*a*b*c*d))
```

3.90 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)}\,dx$

Optimal. Leaf size=343

$$\frac{4bB^2d(c+dx)}{(bc-ad)^3g^3i(a+bx)}-\frac{b^2B^2(c+dx)^2}{4(bc-ad)^3g^3i(a+bx)^2}+\frac{4bBd(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^3g^3i(a+bx)}-\frac{b^2B(c+dx)^2\left(A+\cdots\right.}{2(bc-ad)^3g\cdots}$$

```
[Out] 4*b*B^2*d*(d*x+c)/(-a*d+b*c)^3/g^3/i/(b*x+a)-1/4*b^2*B^2*(d*x+c)^2/(-a*d+b*
c)^3/g^3/i/(b*x+a)^2+4*b*B*d*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)
^3/g^3/i/(b*x+a)-1/2*b^2*B*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)
^3/g^3/i/(b*x+a)^2+2*b*d*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3
/g^3/i/(b*x+a)-1/2*b^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3
/g^3/i/(b*x+a)^2+1/3*d^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^3/B/(-a*d+b*c)^3/g^3/i
```

Rubi [A]
time = 0.26, antiderivative size = 343, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2562, 2395, 2342, 2341, 2339, 30}

$$-\frac{b^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3i(a+bx)^2(bc-ad)^3}-\frac{b^2B(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i(a+bx)^2(bc-ad)^3}+\frac{d^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bg^3i(bc-ad)^3}+\frac{2bd(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^3i(a+bx)(bc-ad)^3}+\frac{4bBd(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i(a+bx)(bc-ad)^3}-\frac{b^2B^2(c+dx)^2}{4g^3i(a+bx)^2(bc-ad)^3}+\frac{4bB^2d(c+dx)}{g^3i(a+bx)(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*i*x)),
x]
```

```
[Out] (4*b*B^2*d*(c + d*x))/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*B^2*(c + d*x)^
2)/(4*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (4*b*B*d*(c + d*x)*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*B*(c + d*x)^2
*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^3*i*(a + b*x)^2)
+ (2*b*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g
^3*i*(a + b*x)) - (b^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(2*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (d^2*(A + B*Log[(e*(a + b*x))/(c + d*
x)])^3)/(3*B*(b*c - a*d)^3*g^3*i)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(90c+90dx)(ag+bgx)^3}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)g^3(a+bx)^3} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)^2} + \frac{bd^2\left(A+B\right.}{90(bc-\ldots}\right.$$

$$= \frac{(bd^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{90(bc-ad)^3g^3} - \frac{d^3\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{90(bc-ad)^3g^3} - \frac{(bd)\int \ldots}{90(bc-\ldots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\ldots}{90(\ldots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\ldots}{90(\ldots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\ldots}{90(\ldots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\ldots}{90(\ldots}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{180(bc-ad)g^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc-ad)^2g^3(a+bx)} + \frac{Bd^2\log(a+b\ldots}{30\ldots}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{180(bc-ad)g^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc-ad)^2g^3(a+bx)} + \frac{Bd^2\log(a+b\ldots}{30\ldots}$$

$$= -\frac{B^2d^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{90(bc-ad)^3g^3} - \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{180(bc-ad)g^3(a+bx)^2} + \frac{Bd\left(A+\ldots\right.}{30(bc-\ldots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+b\ldots}{180(bc-ad)^3g\ldots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+b\ldots}{180(bc-ad)^3g\ldots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+b\ldots}{180(bc-ad)^3g\ldots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+b\ldots}{180(bc-ad)^3g\ldots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+b\ldots}{180(bc-ad)^3g\ldots}$$

Mathematica [A]
time = 0.68, size = 318, normalized size = 0.93

$$\frac{-3(2A^2+2AB+B^2)(bc-ad)^2+6(2A^2+6AB+7B^2)d(bc-ad)(a+bx)+6(2A^2+6AB+7B^2)d^2(a+bx)^2\log(a+bx)-6B(bc-ad)(-6aAd-7aBd+bB(c-6dx)+2Ab(c-2dx))\log\left(\frac{e(a+bx)}{c+dx}\right)-6B(-2a^2Ad^2-4abd(Adx+B(c+dx))+b^2(-2Ad^2x^2+B(c^2-2cdx-3d^2x^2)))\log^2\left(\frac{e(a+bx)}{c+dx}\right)+4B^2d^2(a+bx)^2\log^3\left(\frac{e(a+bx)}{c+dx}\right)-6(2A^2+6AB+7B^2)d^2(a+bx)^2\log(c+dx)}{12(bc-ad)^3g^3i(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*
i*x)),x]
```

```
[Out] (-3*(2*A^2 + 2*A*B + B^2)*(b*c - a*d)^2 + 6*(2*A^2 + 6*A*B + 7*B^2)*d*(b*c
- a*d)*(a + b*x) + 6*(2*A^2 + 6*A*B + 7*B^2)*d^2*(a + b*x)^2*Log[a + b*x] -
 6*B*(b*c - a*d)*(-6*a*A*d - 7*a*B*d + b*B*(c - 6*d*x) + 2*A*b*(c - 2*d*x))
*Log[(e*(a + b*x))/(c + d*x)] - 6*B*(-2*a^2*A*d^2 - 4*a*b*d*(A*d*x + B*(c +
 d*x)) + b^2*(-2*A*d^2*x^2 + B*(c^2 - 2*c*d*x - 3*d^2*x^2)))*Log[(e*(a + b*
x))/(c + d*x)]^2 + 4*B^2*d^2*(a + b*x)^2*Log[(e*(a + b*x))/(c + d*x)]^3 - 6
*(2*A^2 + 6*A*B + 7*B^2)*d^2*(a + b*x)^2*Log[c + d*x])/(12*(b*c - a*d)^3*g^
3*i*(a + b*x)^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 881 vs. 2(335) = 670.
time = 0.66, size = 882, normalized size = 2.57 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/2*d^2*e/i/(a*d-b*c)^4/g^3*A^2*b^2/(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2+2*d^3/i/(a*d-b*c)^4/g^3*A^2*b/(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d
^4/e/i/(a*d-b*c)^4/g^3*A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*d^2*e/i/(a*d-b
*c)^4/g^3*A*B*b^2*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-4*d^3/i/(a*d-b*c)^4/g^3*A
*B*b*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/(b
*e/d+(a*d-b*c)*e/d/(d*x+c)))+d^4/e/i/(a*d-b*c)^4/g^3*A*B*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))^2+d^2*e/i/(a*d-b*c)^4/g^3*B^2*b^2*(-1/2/(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+
c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-
2*d^3/i/(a*d-b*c)^4/g^3*B^2*b*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))+1/3*d^4/e/i/(a*d-b*c)^4/g^3*B^
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2118 vs. 2(319) = 638.
time = 0.65, size = 2118, normalized size = 6.17

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] -1/2*B^2*((2*b*d*x - b*c + 3*a*d)/((-I*b^4*c^2 + 2*I*a*b^3*c*d - I*a^2*b^2*
d^2)*g^3*x^2 + 2*(-I*a*b^3*c^2 + 2*I*a^2*b^2*c*d - I*a^3*b*d^2)*g^3*x + (-I
*a^2*b^2*c^2 + 2*I*a^3*b*c*d - I*a^4*d^2)*g^3) + 2*d^2*log(b*x + a)/((-I*b^
3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3) - 2*d^2*log(d*x
 + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3))*l
og(b*x*e/(d*x + c) + a*e/(d*x + c))^2 - A*B*((2*b*d*x - b*c + 3*a*d)/((-I*b
^4*c^2 + 2*I*a*b^3*c*d - I*a^2*b^2*d^2)*g^3*x^2 + 2*(-I*a*b^3*c^2 + 2*I*a^2
*b^2*c*d - I*a^3*b*d^2)*g^3*x + (-I*a^2*b^2*c^2 + 2*I*a^3*b*c*d - I*a^4*d^2
)*g^3) + 2*d^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^
2 + I*a^3*d^3)*g^3) - 2*d^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3
*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 1/
12*B^2*(6*(I*b^2*c^2 - 8*I*a*b*c*d + 7*I*a^2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*
a*b*d^2*x - I*a^2*d^2)*log(b*x + a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x -
 I*a^2*d^2)*log(d*x + c)^2 - 6*(I*b^2*c*d - I*a*b*d^2)*x - 6*(I*b^2*d^2*x^2
 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x + a) - 2*(-3*I*b^2*d^2*x^2 - 6*I*a*b*
d^2*x - 3*I*a^2*d^2 + 2*(I*b^2*d^2*x^2 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x
 + a))*log(d*x + c))*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(a^2*b^3*c^3*g^3
- 3*a^3*b^2*c^2*d*g^3 + 3*a^4*b*c*d^2*g^3 - a^5*d^3*g^3 + (b^5*c^3*g^3 - 3*
a*b^4*c^2*d*g^3 + 3*a^2*b^3*c*d^2*g^3 - a^3*b^2*d^3*g^3)*x^2 + 2*(a*b^4*c^3
*g^3 - 3*a^2*b^3*c^2*d*g^3 + 3*a^3*b^2*c*d^2*g^3 - a^4*b*d^3*g^3)*x) + (3*I
*b^2*c^2 - 48*I*a*b*c*d + 45*I*a^2*d^2 - 4*(I*b^2*d^2*x^2 + 2*I*a*b*d^2*x +
 I*a^2*d^2)*log(b*x + a)^3 - 4*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^2)
*log(d*x + c)^3 - 18*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^2)*log(b*x +
 a)^2 - 6*(-3*I*b^2*d^2*x^2 - 6*I*a*b*d^2*x - 3*I*a^2*d^2 + 2*(I*b^2*d^2*x^
2 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x + a))*log(d*x + c)^2 - 42*(I*b^2*c*d
 - I*a*b*d^2)*x - 42*(I*b^2*d^2*x^2 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x +
a) - 6*(-7*I*b^2*d^2*x^2 - 14*I*a*b*d^2*x - 7*I*a^2*d^2 + 2*(-I*b^2*d^2*x^2
 - 2*I*a*b*d^2*x - I*a^2*d^2)*log(b*x + a)^2 + 6*(I*b^2*d^2*x^2 + 2*I*a*b*d
^2*x + I*a^2*d^2)*log(b*x + a))*log(d*x + c))/(a^2*b^3*c^3*g^3 - 3*a^3*b^2*
c^2*d*g^3 + 3*a^4*b*c*d^2*g^3 - a^5*d^3*g^3 + (b^5*c^3*g^3 - 3*a*b^4*c^2*d*
g^3 + 3*a^2*b^3*c*d^2*g^3 - a^3*b^2*d^3*g^3)*x^2 + 2*(a*b^4*c^3*g^3 - 3*a^2
*b^3*c^2*d*g^3 + 3*a^3*b^2*c*d^2*g^3 - a^4*b*d^3*g^3)*x)) - 1/2*A^2*((2*b*d
*x - b*c + 3*a*d)/((-I*b^4*c^2 + 2*I*a*b^3*c*d - I*a^2*b^2*d^2)*g^3*x^2 + 2
*(-I*a*b^3*c^2 + 2*I*a^2*b^2*c*d - I*a^3*b*d^2)*g^3*x + (-I*a^2*b^2*c^2 + 2
*I*a^3*b*c*d - I*a^4*d^2)*g^3) + 2*d^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^
2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3) - 2*d^2*log(d*x + c)/((-I*b^3*c
^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3)) + 1/2*(I*b^2*c^2
- 8*I*a*b*c*d + 7*I*a^2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^2
)*log(b*x + a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^2)*log(d*x +
 c)^2 - 6*(I*b^2*c*d - I*a*b*d^2)*x - 6*(I*b^2*d^2*x^2 + 2*I*a*b*d^2*x + I*
```

a^2*d^2)*log(b*x + a) - 2*(-3*I*b^2*d^2*x^2 - 6*I*a*b*d^2*x - 3*I*a^2*d^2 +
 2*(I*b^2*d^2*x^2 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x + a))*log(d*x + c))*
A*B/(a^2*b^3*c^3*g^3 - 3*a^3*b^2*c^2*d*g^3 + 3*a^4*b*c*d^2*g^3 - a^5*d^3*g^
3 + (b^5*c^3*g^3 - 3*a*b^4*c^2*d*g^3 + 3*a^2*b^3*c*d^2*g^3 - a^3*b^2*d^3*g^
3)*x^2 + 2*(a*b^4*c^3*g^3 - 3*a^2*b^3*c^2*d*g^3 + 3*a^3*b^2*c*d^2*g^3 - a^4
*b*d^3*g^3)*x)

Fricas [**A**]
time = 0.38, size = 549, normalized size = 1.60

$$\frac{3\,{\left(2 i \, A^{2} + 2 i \, A B + i \, B^{2}\right)} b^{2} c^{2} + 24 \, {\left(-i \, A^{2} - 2 i \, A B - 2 i \, B^{2}\right)} a b c d + 3 \, {\left(6 i \, A^{2} + 14 i \, A B + 15 i \, B^{2}\right)} a^{2} d^{2} + 4 \, {\left(-i \, B^{2} b^{2} d^{2} x^{2} - 2 i \, B^{2} a b d^{2} x - i \, B^{2} a^{2} d^{2}\right)} \log\left(\frac{{\left(b x + a\right)} e}{d x + c}\right)^{3} + 6 \, {\left({\left(-2 i \, A B - 3 i \, B^{2}\right)} b^{2} d^{2} x^{2} + i \, B^{2} b^{2} c^{2} - 4 i \, B^{2} a b c d - 2 i \, A B a^{2} d^{2} + 2 \, {\left(-i \, B^{2} b^{2} c d + 2 \, {\left(-i \, A B - i \, B^{2}\right)} a b d^{2}\right)} x\right)} \log\left(\frac{{\left(b x + a\right)} e}{d x + c}\right)^{2} + 6 \, {\left({\left(-2 i \, A^{2} - 6 i \, A B - 7 i \, B^{2}\right)} b^{2} c d + {\left(2 i \, A^{2} + 6 i \, A B + 7 i \, B^{2}\right)} a b d^{2}\right)} x + 6 \, {\left({\left(-2 i \, A^{2} - 6 i \, A B - 7 i \, B^{2}\right)} b^{2} d^{2} x^{2} - 2 i \, A^{2} a^{2} d^{2} + {\left(2 i \, A B + i \, B^{2}\right)} b^{2} c^{2} + 8 \, {\left(-i \, A B - i \, B^{2}\right)} a b c d + 2 \, {\left({\left(-2 i \, A B - 3 i \, B^{2}\right)} b^{2} c d + 2 \, {\left(-i \, A^{2} - 2 i \, A B - 2 i \, B^{2}\right)} a b d^{2}\right)} x\right)} \log\left(\frac{{\left(b x + a\right)} e}{d x + c}\right)}{12 \, {\left({\left(b^{5} c^{3} - 3 \, a b^{4} c^{2} d + 3 \, a^{2} b^{3} c d^{2} - a^{3} b^{2} d^{3}\right)} g^{3} x^{2} + 2 \, {\left(a b^{4} c^{3} - 3 \, a^{2} b^{3} c^{2} d + 3 \, a^{3} b^{2} c d^{2} - a^{4} b d^{3}\right)} g^{3} x + {\left(a^{2} b^{3} c^{3} - 3 \, a^{3} b^{2} c^{2} d + 3 \, a^{4} b c d^{2} - a^{5} d^{3}\right)} g^{3}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] 1/12*(3*(2*I*A^2 + 2*I*A*B + I*B^2)*b^2*c^2 + 24*(-I*A^2 - 2*I*A*B - 2*I*B^
2)*a*b*c*d + 3*(6*I*A^2 + 14*I*A*B + 15*I*B^2)*a^2*d^2 + 4*(-I*B^2*b^2*d^2*
x^2 - 2*I*B^2*a*b*d^2*x - I*B^2*a^2*d^2)*log((b*x + a)*e/(d*x + c))^3 + 6*(
(-2*I*A*B - 3*I*B^2)*b^2*d^2*x^2 + I*B^2*b^2*c^2 - 4*I*B^2*a*b*c*d - 2*I*A*
B*a^2*d^2 + 2*(-I*B^2*b^2*c*d + 2*(-I*A*B - I*B^2)*a*b*d^2)*x)*log((b*x + a
)*e/(d*x + c))^2 + 6*((-2*I*A^2 - 6*I*A*B - 7*I*B^2)*b^2*c*d + (2*I*A^2 + 6
*I*A*B + 7*I*B^2)*a*b*d^2)*x + 6*((-2*I*A^2 - 6*I*A*B - 7*I*B^2)*b^2*d^2*x^
2 - 2*I*A^2*a^2*d^2 + (2*I*A*B + I*B^2)*b^2*c^2 + 8*(-I*A*B - I*B^2)*a*b*c*
d + 2*((-2*I*A*B - 3*I*B^2)*b^2*c*d + 2*(-I*A^2 - 2*I*A*B - 2*I*B^2)*a*b*d^
2)*x)*log((b*x + a)*e/(d*x + c)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d
^2 - a^3*b^2*d^3)*g^3*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^
2 - a^4*b*d^3)*g^3*x + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 - a^5
*d^3)*g^3)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1488 vs. $2(303) = 606$.
time = 5.46, size = 1488, normalized size = 4.34

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3/(d*i*x+c*i),x)
```

```
[Out] -B**2*d**2*log(e*(a + b*x)/(c + d*x))**3/(3*a**3*d**3*g**3*i - 9*a**2*b*c*d
**2*g**3*i + 9*a*b**2*c**2*d*g**3*i - 3*b**3*c**3*g**3*i) + d**2*(2*A**2 +
6*A*B + 7*B**2)*log(x + (2*A**2*a*d**3 + 2*A**2*b*c*d**2 + 6*A*B*a*d**3 + 6
*A*B*b*c*d**2 + 7*B**2*a*d**3 + 7*B**2*b*c*d**2 - a**4*d**6*(2*A**2 + 6*A*B
 + 7*B**2)/(a*d - b*c)**3 + 4*a**3*b*c*d**5*(2*A**2 + 6*A*B + 7*B**2)/(a*d
- b*c)**3 - 6*a**2*b**2*c**2*d**4*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3
+ 4*a*b**3*c**3*d**3*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 - b**4*c**4*d
```

```
**2*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b*d**3 + 12*A*B*b*d**
3 + 14*B**2*b*d**3))/(2*g**3*i*(a*d - b*c)**3) - d**2*(2*A**2 + 6*A*B + 7*B
**2)*log(x + (2*A**2*a*d**3 + 2*A**2*b*c*d**2 + 6*A*B*a*d**3 + 6*A*B*b*c*d*
*2 + 7*B**2*a*d**3 + 7*B**2*b*c*d**2 + a**4*d**6*(2*A**2 + 6*A*B + 7*B**2)/
(a*d - b*c)**3 - 4*a**3*b*c*d**5*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 +
 6*a**2*b**2*c**2*d**4*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 - 4*a*b**3*
c**3*d**3*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 + b**4*c**4*d**2*(2*A**2
 + 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b*d**3 + 12*A*B*b*d**3 + 14*B**2
*b*d**3))/(2*g**3*i*(a*d - b*c)**3) + (6*A*B*a*d - 2*A*B*b*c + 4*A*B*b*d*x
+ 7*B**2*a*d - B**2*b*c + 6*B**2*b*d*x)*log(e*(a + b*x)/(c + d*x))/(2*a**4*
d**2*g**3*i - 4*a**3*b*c*d*g**3*i + 4*a**3*b*d**2*g**3*i*x + 2*a**2*b**2*c*
*2*g**3*i - 8*a**2*b**2*c*d*g**3*i*x + 2*a**2*b**2*d**2*g**3*i*x**2 + 4*a*b
**3*c**2*g**3*i*x - 4*a*b**3*c*d*g**3*i*x**2 + 2*b**4*c**2*g**3*i*x**2) + (
-2*A*B*a**2*d**2 - 4*A*B*a*b*d**2*x - 2*A*B*b**2*d**2*x**2 - 4*B**2*a*b*c*d
 - 4*B**2*a*b*d**2*x + B**2*b**2*c**2 - 2*B**2*b**2*c*d*x - 3*B**2*b**2*d**
2*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a**5*d**3*g**3*i - 6*a**4*b*c*d**2
*g**3*i + 4*a**4*b*d**3*g**3*i*x + 6*a**3*b**2*c**2*d*g**3*i - 12*a**3*b**2
*c*d**2*g**3*i*x + 2*a**3*b**2*d**3*g**3*i*x**2 - 2*a**2*b**3*c**3*g**3*i +
 12*a**2*b**3*c**2*d*g**3*i*x - 6*a**2*b**3*c*d**2*g**3*i*x**2 - 4*a*b**4*c
**3*g**3*i*x + 6*a*b**4*c**2*d*g**3*i*x**2 - 2*b**5*c**3*g**3*i*x**2) + (6*
A**2*a*d - 2*A**2*b*c + 14*A*B*a*d - 2*A*B*b*c + 15*B**2*a*d - B**2*b*c + x
*(4*A**2*b*d + 12*A*B*b*d + 14*B**2*b*d))/(4*a**4*d**2*g**3*i - 8*a**3*b*c*
d*g**3*i + 4*a**2*b**2*c**2*g**3*i + x**2*(4*a**2*b**2*d**2*g**3*i - 8*a*b*
*3*c*d*g**3*i + 4*b**4*c**2*g**3*i) + x*(8*a**3*b*d**2*g**3*i - 16*a**2*b**
2*c*d*g**3*i + 8*a*b**3*c**2*g**3*i))
```

Giac [A]
time = 63.57, size = 182, normalized size = 0.53

$$\frac{\left(2i\,B^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)^2+4i\,ABe^3\log\left(\frac{bxe+ae}{dx+c}\right)+2i\,B^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)+2i\,A^2e^3+2i\,ABe^3+i\,B^2e^3\right)(dx+c)^2\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)^2}{4\,(bxe+ae)^2g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] 1/4*(2*I*B^2*e^3*log((b*x*e + a*e)/(d*x + c))^2 + 4*I*A*B*e^3*log((b*x*e +
a*e)/(d*x + c)) + 2*I*B^2*e^3*log((b*x*e + a*e)/(d*x + c)) + 2*I*A^2*e^3 +
2*I*A*B*e^3 + I*B^2*e^3)*(d*x + c)^2*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a
*d/((b*c*e - a*d*e)*(b*c - a*d)))^2/((b*x*e + a*e)^2*g^3)
```

Mupad [B]
time = 8.30, size = 981, normalized size = 2.86

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)^3*(c*i + d*i*x)),
x)
```

```
[Out] log((e*(a + b*x))/(c + d*x))^2*(((B^2*d^2*((2*a^2*d^2 + b^2*c^2 - 3*a*b*c*d
)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)))/(g^3*i*(a^3*d^3 - b^3*c^3 + 3*a*b
^2*c^2*d - 3*a^2*b*c*d^2)) + (B^2*x*(a*d - b*c))/(g^3*i*(a^3*d^3 - b^3*c^3
+ 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)))/((b*x^2)/d + a^2/(b*d) + (2*a*x)/d) - (B
*d^2*(2*A + 3*B))/(2*g^3*i*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d
^2))) - ((6*A^2*a*d - 2*A^2*b*c + 15*B^2*a*d - B^2*b*c + 14*A*B*a*d - 2*A*B
*b*c)/(2*(a*d - b*c)) + (x*(2*A^2*b*d + 7*B^2*b*d + 6*A*B*b*d))/(a*d - b*c)
)/(x^2*(2*b^3*c*g^3*i - 2*a*b^2*d*g^3*i) + x*(4*a*b^2*c*g^3*i - 4*a^2*b*d*g
^3*i) - 2*a^3*d*g^3*i + 2*a^2*b*c*g^3*i) + (log((e*(a + b*x))/(c + d*x))*((
B*d^2*((2*a^2*d^2 + b^2*c^2 - 3*a*b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d
^2))*(2*A + 3*B))/(g^3*i*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2
)) - B^2/(b*d*g^3*i*(a*d - b*c)) + (B*x*(2*A + 3*B)*(a*d - b*c))/(g^3*i*(a^
3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))))/((b*x^2)/d + a^2/(b*d)
+ (2*a*x)/d) - (B^2*d^2*log((e*(a + b*x))/(c + d*x))^3)/(3*g^3*i*(a^3*d^3 -
 b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (d^2*atan((d^2*(A^2 + (7*B^2)/
2 + 3*A*B)*(2*a^3*d^3*g^3*i + 2*b^3*c^3*g^3*i - 2*a*b^2*c^2*d*g^3*i - 2*a^2
*b*c*d^2*g^3*i)*1i)/(g^3*i*(a*d - b*c)^3*(2*A^2*d^2 + 7*B^2*d^2 + 6*A*B*d^2
)) + (b*d^3*x*(a^2*d^2*g^3*i + b^2*c^2*g^3*i - 2*a*b*c*d*g^3*i)*(A^2 + (7*B
^2)/2 + 3*A*B)*4i)/(g^3*i*(a*d - b*c)^3*(2*A^2*d^2 + 7*B^2*d^2 + 6*A*B*d^2)
))*(A^2 + (7*B^2)/2 + 3*A*B)*2i)/(g^3*i*(a*d - b*c)^3)
```

3.91 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)}\,dx$

Optimal. Leaf size=507

$$-\frac{6bB^2d^2(c+dx)}{(bc-ad)^4g^4i(a+bx)}+\frac{3b^2B^2d(c+dx)^2}{4(bc-ad)^4g^4i(a+bx)^2}-\frac{2b^3B^2(c+dx)^3}{27(bc-ad)^4g^4i(a+bx)^3}-\frac{6bBd^2(c+dx)\left(A+B\log\left(\right.\right.}{(bc-ad)^4g^4i(a+bx}$$

```
[Out] -6*b*B^2*d^2*(d*x+c)/(-a*d+b*c)^4/g^4/i/(b*x+a)+3/4*b^2*B^2*d*(d*x+c)^2/(-a
*d+b*c)^4/g^4/i/(b*x+a)^2-2/27*b^3*B^2*(d*x+c)^3/(-a*d+b*c)^4/g^4/i/(b*x+a)
^3-6*b*B*d^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^4/i/(b*x+a)
+3/2*b^2*B*d*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^4/i/(b*x+
a)^2-2/9*b^3*B*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^4/i/(b*
x+a)^3-3*b*d^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^4/g^4/i/(b*
x+a)+3/2*b^2*d*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^4/g^4/i/(
b*x+a)^2-1/3*b^3*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^4/g^4/i
/(b*x+a)^3-1/3*d^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^3/B/(-a*d+b*c)^4/g^4/i
```

Rubi [A]
time = 0.32, antiderivative size = 507, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2562, 2395, 2342, 2341, 2339, 30}

$$-\frac{b^3(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4i(a+bx)^3(bc-ad)^4}-\frac{2b^3B(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^4i(a+bx)^3(bc-ad)^4}+\frac{3b^2d(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^4i(a+bx)^2(bc-ad)^4}+\frac{3b^2Bd(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^4i(a+bx)^2(bc-ad)^4}-\frac{d^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bg^4i(bc-ad)^4}-\frac{3bd^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^4i(a+bx)(bc-ad)^4}-\frac{6bBd^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i(a+bx)(bc-ad)^4}-\frac{2b^3B^2(c+dx)^3}{27g^4i(a+bx)^3(bc-ad)^4}+\frac{3b^2B^2d(c+dx)^2}{4g^4i(a+bx)^2(bc-ad)^4}-\frac{6bB^2d^2(c+dx)}{g^4i(a+bx)(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*i*x)),
x]
```

```
[Out] (-6*b*B^2*d^2*(c + d*x))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*B^2*d*(c
+ d*x)^2)/(4*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (2*b^3*B^2*(c + d*x)^3)/(27
*(b*c - a*d)^4*g^4*i*(a + b*x)^3) - (6*b*B*d^2*(c + d*x)*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*B*d*(c + d*x)^
2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^4*g^4*i*(a + b*x)^2)
 - (2*b^3*B*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d
)^4*g^4*i*(a + b*x)^3) - (3*b*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2)/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*d*(c + d*x)^2*(A + B*Log[
(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (b^3*(c
+ d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^4*g^4*i*(a
+ b*x)^3) - (d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^4
*g^4*i)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(91c+91dx)(ag+bgx)^4}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc-ad)g^4(a+bx)^4} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc-ad)^2g^4(a+bx)^3} + \frac{bd^2\left(A+B\right.}{91(bc-a}\right.$$

$$= -\frac{(bd^3)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{91(bc-ad)^4g^4} + \frac{d^4\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{91(bc-ad)^4g^4} + \frac{(bd^2)\int \frac{(A+}{}}{91(b}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\right.\right.}{91(bc-ad)^3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\right.\right.}{91(bc-ad)^3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\right.\right.}{91(bc-ad)^3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\right.\right.}{91(bc-ad)^3g}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{819(bc-ad)g^4(a+bx)^3} + \frac{5Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{546(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2\left(A+\right.}{273(bc-}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{819(bc-ad)g^4(a+bx)^3} + \frac{5Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{546(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2\left(A+\right.}{273(bc-}$$

$$= \frac{B^2d^3\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{91(bc-ad)^4g^4} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{819(bc-ad)g^4(a+bx)^3} + \frac{5Bd\left(A+\right.}{546(bc-}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{1638(bc-ad}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{1638(bc-ad}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{1638(bc-ad}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{1638(bc-ad}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{1638(bc-ad}$$

Mathematica [A]
time = 0.91, size = 442, normalized size = 0.87

$$-\frac{4(9A^2+6AB+2B^2)(bc-ad)^3-3(18A^2+30AB+19B^2)d(bc-ad)^2(a+bx)-6(18A^2+66AB+85B^2)d^2(-bc+ad)(a+bx)^2+6(18A^2+66AB+85B^2)d^3(a+bx)^3\log(a+bx)+6B(bc-ad)\left(4(3A+B)(bc-ad)^2+3(6A+5B)d(-bc+ad)(a+bx)+6(6A+11B)d^2(a+bx)^2\right)\log\left(\frac{e(a+bx)}{c+dx}\right)+18B(6a^3Ad^3+18a^2bd^2(Adx+B(c+dx))+9ab^2d(2Ad^2x^2+B(-c^2+2cdx+3d^2x^2))+b^3(6Ad^3x^3+B(2c^3-3c^2dx+6cd^2x^2+11d^3x^3)))\log^2\left(\frac{e(a+bx)}{c+dx}\right)+36B^2d^3(a+bx)^3\log^3\left(\frac{e(a+bx)}{c+dx}\right)-6(18A^2+66AB+85B^2)d^3(a+bx)^3\log(c+dx)}{108(bc-ad)^4g^4i(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*
i*x)),x]
```

```
[Out] -1/108*(4*(9*A^2 + 6*A*B + 2*B^2)*(b*c - a*d)^3 - 3*(18*A^2 + 30*A*B + 19*B
^2)*d*(b*c - a*d)^2*(a + b*x) - 6*(18*A^2 + 66*A*B + 85*B^2)*d^2*(-(b*c) +
a*d)*(a + b*x)^2 + 6*(18*A^2 + 66*A*B + 85*B^2)*d^3*(a + b*x)^3*Log[a + b*x
] + 6*B*(b*c - a*d)*(4*(3*A + B)*(b*c - a*d)^2 + 3*(6*A + 5*B)*d*(-(b*c) +
a*d)*(a + b*x) + 6*(6*A + 11*B)*d^2*(a + b*x)^2)*Log[(e*(a + b*x))/(c + d*x
)] + 18*B*(6*a^3*A*d^3 + 18*a^2*b*d^2*(A*d*x + B*(c + d*x)) + 9*a*b^2*d*(2*
A*d^2*x^2 + B*(-c^2 + 2*c*d*x + 3*d^2*x^2)) + b^3*(6*A*d^3*x^3 + B*(2*c^3 -
 3*c^2*d*x + 6*c*d^2*x^2 + 11*d^3*x^3)))*Log[(e*(a + b*x))/(c + d*x)]^2 + 3
6*B^2*d^3*(a + b*x)^3*Log[(e*(a + b*x))/(c + d*x)]^3 - 6*(18*A^2 + 66*A*B +
 85*B^2)*d^3*(a + b*x)^3*Log[c + d*x])/((b*c - a*d)^4*g^4*i*(a + b*x)^3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1243 vs. $2(493) = 986$.
time = 0.80, size = 1244, normalized size = 2.45

method	result	size
derivativedivides	Expression too large to display	1244
default	Expression too large to display	1244
risch	Expression too large to display	1422
norman	Expression too large to display	1693

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/3*d^2*e^2/i/(a*d-b*c)^5/g^4*A^2*b^3/(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^3-3/2*d^3*e/i/(a*d-b*c)^5/g^4*A^2*b^2/(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2+3*d^4/i/(a*d-b*c)^5/g^4*A^2*b/(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d^5/e/i
/(a*d-b*c)^5/g^4*A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2*d^2*e^2/i/(a*d-b*c)^
5/g^4*A*B*b^3*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-1/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)+6*d^3*e/i/(a*d-b*c)^5/g^4*A*B
*b^2*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-6*d^4/i/(a*d-b*c)^5/g^4*A*B*b*(-1/(b*e
/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/(b*e/d+(a*d-b*c
)*e/d/(d*x+c)))+d^5/e/i/(a*d-b*c)^5/g^4*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
```

```
^2-d^2*e^2/i/(a*d-b*c)^5/g^4*B^2*b^3*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))-2/27/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)+3*d^3*e/i/
(a*d-b*c)^5/g^4*B^2*b^2*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))^2-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-3*d^4/i/(a*d-b*c)^5/g^4*
B^2*b*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2
/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2/(b*e/d+(a*
d-b*c)*e/d/(d*x+c)))+1/3*d^5/e/i/(a*d-b*c)^5/g^4*B^2*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))^3)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3407 vs. $2(470) = 940$.
time = 0.96, size = 3407, normalized size = 6.72

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] -1/6*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d
- 5*a*b*d^2)*x)/((I*b^6*c^3 - 3*I*a*b^5*c^2*d + 3*I*a^2*b^4*c*d^2 - I*a^3*b
^3*d^3)*g^4*x^3 + 3*(I*a*b^5*c^3 - 3*I*a^2*b^4*c^2*d + 3*I*a^3*b^3*c*d^2 -
I*a^4*b^2*d^3)*g^4*x^2 + 3*(I*a^2*b^4*c^3 - 3*I*a^3*b^3*c^2*d + 3*I*a^4*b^2
*c*d^2 - I*a^5*b*d^3)*g^4*x + (I*a^3*b^3*c^3 - 3*I*a^4*b^2*c^2*d + 3*I*a^5*
b*c*d^2 - I*a^6*d^3)*g^4) + 6*d^3*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*
d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4) - 6*d^3*log(d*x
 + c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3
 + I*a^4*d^4)*g^4))*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2 - 1/3*A*B*((6*b^
2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)
/((I*b^6*c^3 - 3*I*a*b^5*c^2*d + 3*I*a^2*b^4*c*d^2 - I*a^3*b^3*d^3)*g^4*x^3
 + 3*(I*a*b^5*c^3 - 3*I*a^2*b^4*c^2*d + 3*I*a^3*b^3*c*d^2 - I*a^4*b^2*d^3)*
g^4*x^2 + 3*(I*a^2*b^4*c^3 - 3*I*a^3*b^3*c^2*d + 3*I*a^4*b^2*c*d^2 - I*a^5*
b*d^3)*g^4*x + (I*a^3*b^3*c^3 - 3*I*a^4*b^2*c^2*d + 3*I*a^5*b*c*d^2 - I*a^6
*d^3)*g^4) + 6*d^3*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2
*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4) - 6*d^3*log(d*x + c)/((I*b^4*c
^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g
^4))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - 1/108*B^2*(6*(-4*I*b^3*c^3 + 27
*I*a*b^2*c^2*d - 108*I*a^2*b*c*d^2 + 85*I*a^3*d^3 - 66*(I*b^3*c*d^2 - I*a*b
^2*d^3)*x^2 - 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*
a^3*d^3)*log(b*x + a)^2 - 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*
b*d^3*x - I*a^3*d^3)*log(d*x + c)^2 - 3*(-5*I*b^3*c^2*d + 54*I*a*b^2*c*d^2
- 49*I*a^2*b*d^3)*x - 66*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3
*x + I*a^3*d^3)*log(b*x + a) - 6*(-11*I*b^3*d^3*x^3 - 33*I*a*b^2*d^3*x^2 -
```

```
33*I*a^2*b*d^3*x - 11*I*a^3*d^3 + 6*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*
I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a))*log(d*x + c))*log(b*x*e/(d*x + c)
+ a*e/(d*x + c))/(a^3*b^4*c^4*g^4 - 4*a^4*b^3*c^3*d*g^4 + 6*a^5*b^2*c^2*d^2
*g^4 - 4*a^6*b*c*d^3*g^4 + a^7*d^4*g^4 + (b^7*c^4*g^4 - 4*a*b^6*c^3*d*g^4 +
 6*a^2*b^5*c^2*d^2*g^4 - 4*a^3*b^4*c*d^3*g^4 + a^4*b^3*d^4*g^4)*x^3 + 3*(a*
b^6*c^4*g^4 - 4*a^2*b^5*c^3*d*g^4 + 6*a^3*b^4*c^2*d^2*g^4 - 4*a^4*b^3*c*d^3
*g^4 + a^5*b^2*d^4*g^4)*x^2 + 3*(a^2*b^5*c^4*g^4 - 4*a^3*b^4*c^3*d*g^4 + 6*
a^4*b^3*c^2*d^2*g^4 - 4*a^5*b^2*c*d^3*g^4 + a^6*b*d^4*g^4)*x) + (-8*I*b^3*c
^3 + 81*I*a*b^2*c^2*d - 648*I*a^2*b*c*d^2 + 575*I*a^3*d^3 - 36*(I*b^3*d^3*x
^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a)^3 - 36*(
-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*log(d*x +
 c)^3 - 510*(I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 - 198*(-I*b^3*d^3*x^3 - 3*I*a*b
^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*log(b*x + a)^2 - 18*(-11*I*b^3*d^
3*x^3 - 33*I*a*b^2*d^3*x^2 - 33*I*a^2*b*d^3*x - 11*I*a^3*d^3 + 6*(I*b^3*d^3
*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a))*log(d
*x + c)^2 - 3*(-19*I*b^3*c^2*d + 378*I*a*b^2*c*d^2 - 359*I*a^2*b*d^3)*x - 5
10*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*
x + a) - 6*(-85*I*b^3*d^3*x^3 - 255*I*a*b^2*d^3*x^2 - 255*I*a^2*b*d^3*x - 8
5*I*a^3*d^3 + 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*
a^3*d^3)*log(b*x + a)^2 + 66*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b
*d^3*x + I*a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^4*g^4 - 4*a^4*b^
3*c^3*d*g^4 + 6*a^5*b^2*c^2*d^2*g^4 - 4*a^6*b*c*d^3*g^4 + a^7*d^4*g^4 + (b^
7*c^4*g^4 - 4*a*b^6*c^3*d*g^4 + 6*a^2*b^5*c^2*d^2*g^4 - 4*a^3*b^4*c*d^3*g^4
 + a^4*b^3*d^4*g^4)*x^3 + 3*(a*b^6*c^4*g^4 - 4*a^2*b^5*c^3*d*g^4 + 6*a^3*b^
4*c^2*d^2*g^4 - 4*a^4*b^3*c*d^3*g^4 + a^5*b^2*d^4*g^4)*x^2 + 3*(a^2*b^5*c^4
*g^4 - 4*a^3*b^4*c^3*d*g^4 + 6*a^4*b^3*c^2*d^2*g^4 - 4*a^5*b^2*c*d^3*g^4 +
a^6*b*d^4*g^4)*x)) - 1/6*A^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a
^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((I*b^6*c^3 - 3*I*a*b^5*c^2*d + 3*I*a^2
*b^4*c*d^2 - I*a^3*b^3*d^3)*g^4*x^3 + 3*(I*a*b^5*c^3 - 3*I*a^2*b^4*c^2*d +
3*I*a^3*b^3*c*d^2 - I*a^4*b^2*d^3)*g^4*x^2 + 3*(I*a^2*b^4*c^3 - 3*I*a^3*b^3
*c^2*d + 3*I*a^4*b^2*c*d^2 - I*a^5*b*d^3)*g^4*x + (I*a^3*b^3*c^3 - 3*I*a^4*
b^2*c^2*d + 3*I*a^5*b*c*d^2 - I*a^6*d^3)*g^4) + 6*d^3*log(b*x + a)/((I*b^4*
c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*
g^4) - 6*d^3*log(d*x + c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d
^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4)) - 1/18*(-4*I*b^3*c^3 + 27*I*a*b^2*c
^2*d - 108*I*a^2*b*c*d^2 + 85*I*a^3*d^3 - 66*(I*b^3*c*d^2 - I*a*b^2*d^3)*x^
2 - 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*l
og(b*x + a)^2 - 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x -
I*a^3*d^3)*log(d*x + c)^2 - 3*(-5*I*b^3*c^2*d + 54*I*a*b^2*c*d^2 - 49*I*a^2
*b*d^3)*x - 66*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3
*d^3)*log(b*x + a) - 6*(-11*I*b^3*d^3*x^3 - 33*I*a*b^2*d^3*x^2 - 33*I*a^2*b
*d^3*x - 11*I*a^3*d^3 + 6*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^
3*x + I*a^3*d^3)*log(b*x + a))*log(d*x + c))*A*...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than

twice the leaf count of optimal. 951 vs. $2(470) = 940$.
time = 0.42, size = 951, normalized size = 1.88

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] -1/108*(4*(-9*I*A^2 - 6*I*A*B - 2*I*B^2)*b^3*c^3 + 81*(2*I*A^2 + 2*I*A*B +
I*B^2)*a*b^2*c^2*d + 324*(-I*A^2 - 2*I*A*B - 2*I*B^2)*a^2*b*c*d^2 - (-198*I
*A^2 - 510*I*A*B - 575*I*B^2)*a^3*d^3 + 36*(-I*B^2*b^3*d^3*x^3 - 3*I*B^2*a*
b^2*d^3*x^2 - 3*I*B^2*a^2*b*d^3*x - I*B^2*a^3*d^3)*log((b*x + a)*e/(d*x + c
))^3 + 6*((-18*I*A^2 - 66*I*A*B - 85*I*B^2)*b^3*c*d^2 + (18*I*A^2 + 66*I*A*
B + 85*I*B^2)*a*b^2*d^3)*x^2 + 18*((-6*I*A*B - 11*I*B^2)*b^3*d^3*x^3 - 2*I*
B^2*b^3*c^3 + 9*I*B^2*a*b^2*c^2*d - 18*I*B^2*a^2*b*c*d^2 - 6*I*A*B*a^3*d^3
+ 3*(-2*I*B^2*b^3*c*d^2 + 3*(-2*I*A*B - 3*I*B^2)*a*b^2*d^3)*x^2 + 3*(I*B^2*
b^3*c^2*d - 6*I*B^2*a*b^2*c*d^2 + 6*(-I*A*B - I*B^2)*a^2*b*d^3)*x)*log((b*x
 + a)*e/(d*x + c))^2 + 3*((18*I*A^2 + 30*I*A*B + 19*I*B^2)*b^3*c^2*d + 54*(
-2*I*A^2 - 6*I*A*B - 7*I*B^2)*a*b^2*c*d^2 + (90*I*A^2 + 294*I*A*B + 359*I*B
^2)*a^2*b*d^3)*x + 6*((-18*I*A^2 - 66*I*A*B - 85*I*B^2)*b^3*d^3*x^3 - 18*I*
A^2*a^3*d^3 + 4*(-3*I*A*B - I*B^2)*b^3*c^3 + 27*(2*I*A*B + I*B^2)*a*b^2*c^2
*d + 108*(-I*A*B - I*B^2)*a^2*b*c*d^2 + 3*(2*(-6*I*A*B - 11*I*B^2)*b^3*c*d^
2 + 9*(-2*I*A^2 - 6*I*A*B - 7*I*B^2)*a*b^2*d^3)*x^2 + 3*((6*I*A*B + 5*I*B^2
)*b^3*c^2*d + 18*(-2*I*A*B - 3*I*B^2)*a*b^2*c*d^2 + 18*(-I*A^2 - 2*I*A*B -
2*I*B^2)*a^2*b*d^3)*x)*log((b*x + a)*e/(d*x + c)))/((b^7*c^4 - 4*a*b^6*c^3*
d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^4*x^3 + 3*(a*b^6*c
^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5*b^2*d^4)*g
^4*x^2 + 3*(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2 - 4*a^5*b^2*c
*d^3 + a^6*b*d^4)*g^4*x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6*a^5*b^2*c^2*d^
2 - 4*a^6*b*c*d^3 + a^7*d^4)*g^4)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 2388 vs. $2(459) = 918$.
time = 36.67, size = 2388, normalized size = 4.71

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4/(d*i*x+c*i),x)
```

```
[Out] -B**2*d**3*log(e*(a + b*x)/(c + d*x))**3/(3*a**4*d**4*g**4*i - 12*a**3*b*c*
d**3*g**4*i + 18*a**2*b**2*c**2*d**2*g**4*i - 12*a*b**3*c**3*d*g**4*i + 3*b
**4*c**4*g**4*i) + d**3*(18*A**2 + 66*A*B + 85*B**2)*log(x + (18*A**2*a*d**
4 + 18*A**2*b*c*d**3 + 66*A*B*a*d**4 + 66*A*B*b*c*d**3 + 85*B**2*a*d**4 + 8
```

5*B**2*b*c*d**3 - a**5*d**8*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 5
*a**4*b*c*d**7*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 10*a**3*b**2*c
2*d6*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 10*a**2*b**3*c**3*d*
5(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 5*a*b**4*c**4*d**4*(18*A**
2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + b**5*c**5*d**3*(18*A**2 + 66*A*B + 8
5*B**2)/(a*d - b*c)**4)/(36*A**2*b*d**4 + 132*A*B*b*d**4 + 170*B**2*b*d**4)
)/(18*g**4*i*(a*d - b*c)**4) - d**3*(18*A**2 + 66*A*B + 85*B**2)*log(x + (1
8*A**2*a*d**4 + 18*A**2*b*c*d**3 + 66*A*B*a*d**4 + 66*A*B*b*c*d**3 + 85*B**
2*a*d**4 + 85*B**2*b*c*d**3 + a**5*d**8*(18*A**2 + 66*A*B + 85*B**2)/(a*d -
b*c)**4 - 5*a**4*b*c*d**7*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 10
*a**3*b**2*c**2*d**6*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 10*a**2*
b**3*c**3*d**5*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 5*a*b**4*c**4*
d**4*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - b**5*c**5*d**3*(18*A**2
+ 66*A*B + 85*B**2)/(a*d - b*c)**4)/(36*A**2*b*d**4 + 132*A*B*b*d**4 + 170*
B**2*b*d**4))/(18*g**4*i*(a*d - b*c)**4) + (66*A*B*a**2*d**2 - 42*A*B*a*b*c
*d + 90*A*B*a*b*d**2*x + 12*A*B*b**2*c**2 - 18*A*B*b**2*c*d*x + 36*A*B*b**2
*d**2*x**2 + 85*B**2*a**2*d**2 - 23*B**2*a*b*c*d + 147*B**2*a*b*d**2*x + 4*
B**2*b**2*c**2 - 15*B**2*b**2*c*d*x + 66*B**2*b**2*d**2*x**2)*log(e*(a + b*
x)/(c + d*x))/(18*a**6*d**3*g**4*i - 54*a**5*b*c*d**2*g**4*i + 54*a**5*b*d*
*3*g**4*i*x + 54*a**4*b**2*c**2*d*g**4*i - 162*a**4*b**2*c*d**2*g**4*i*x +
54*a**4*b**2*d**3*g**4*i*x**2 - 18*a**3*b**3*c**3*g**4*i + 162*a**3*b**3*c*
*2*d*g**4*i*x - 162*a**3*b**3*c*d**2*g**4*i*x**2 + 18*a**3*b**3*d**3*g**4*i
*x**3 - 54*a**2*b**4*c**3*g**4*i*x + 162*a**2*b**4*c**2*d*g**4*i*x**2 - 54*
a**2*b**4*c*d**2*g**4*i*x**3 - 54*a*b**5*c**3*g**4*i*x**2 + 54*a*b**5*c**2*
d*g**4*i*x**3 - 18*b**6*c**3*g**4*i*x**3) + (-6*A*B*a**3*d**3 - 18*A*B*a**2
*b*d**3*x - 18*A*B*a*b**2*d**3*x**2 - 6*A*B*b**3*d**3*x**3 - 18*B**2*a**2*b
*c*d**2 - 18*B**2*a**2*b*d**3*x + 9*B**2*a*b**2*c**2*d - 18*B**2*a*b**2*c*d
2*x - 27*B2*a*b**2*d**3*x**2 - 2*B**2*b**3*c**3 + 3*B**2*b**3*c**2*d*x
- 6*B**2*b**3*c*d**2*x**2 - 11*B**2*b**3*d**3*x**3)*log(e*(a + b*x)/(c + d*
x))**2/(6*a**7*d**4*g**4*i - 24*a**6*b*c*d**3*g**4*i + 18*a**6*b*d**4*g**4*
i*x + 36*a**5*b**2*c**2*d**2*g**4*i - 72*a**5*b**2*c*d**3*g**4*i*x + 18*a**
5*b**2*d**4*g**4*i*x**2 - 24*a**4*b**3*c**3*d*g**4*i + 108*a**4*b**3*c**2*d
2*g4*i*x - 72*a**4*b**3*c*d**3*g**4*i*x**2 + 6*a**4*b**3*d**4*g**4*i*x*
*3 + 6*a**3*b**4*c**4*g**4*i - 72*a**3*b**4*c**3*d*g**4*i*x + 108*a**3*b**4
*c**2*d**2*g**4*i*x**2 - 24*a**3*b**4*c*d**3*g**4*i*x**3 + 18*a**2*b**5*c**
4*g**4*i*x - 72*a**2*b**5*c**3*d*g**4*i*x**2 + 36*a**2*b**5*c**2*d**2*g**4*
i*x**3 + 18*a*b**6*c**4*g**4*i*x**2 - 24*a*b**6*c**3*d*g**4*i*x**3 + 6*b**7
*c**4*g**4*i*x**3) + (198*A**2*a**2*d**2 - 126*A**2*a*b*c*d + 36*A**2*b**2*
c**2 + 510*A*B*a**2*d**2 - 138*A*B*a*b*c*d + 24*A*B*b**2*c**2 + 575*B**2*a*
*2*d**2 - 73*B**2*a*b*c*d + 8*B**2*b**2*c**2 + x**2*(108*A**2*b**2*d**2 + 3
96*A*B*b**2*d**2 + 510*B**2*b**2*d**2) + x*(270*A**2*a*b*d**2 - 54*A**2*b**
2*c*d + 882*A*B*a*b*d**2 - 90*A*B*b**2*c*d + 1077*B**2*a*b*d**2 - 57*B**2*b
2*c*d))/(108*a6*d**3*g**4*i - 324*a**5*b*c*d**2*g**4*i + 324*a**4*b**2*
c**2*d*g**4*i - 108*a**3*b**3*c**3*g**4*i + x**3*(108*a**3*b**3*d**3*g**4*i
- 324*a**2*b**4*c*d**2*g**4*i + 324*a*b**5*c**2*d*g**4*i - 108*b**6*c**3*g

```
**4*i) + x**2*(324*a**4*b**2*d**3*g**4*i - 972*a**3*b**3*c*d**2*g**4*i + 97
2*a**2*b**4*c**2*d*g**4*i - 324*a*b**5*c**3*g**4*i) + x*(324*a**5*b*d**3*g*
*4*i - 972*a**4*b**2*c*d**2*g**4*i + 972*a**3*b**3*c**2*d*g**4*i - 324*a**2
*b**4*c**3*g**4*i))
```

Giac [A]
time = 77.22, size = 427, normalized size = 0.84

$$-\frac{\left(-36 i B^2 b e^4 \log\left(\frac{bex+ae}{dx+c}\right)^2 + \frac{54 i (bex+ae) B^2 d e^3 \log\left(\frac{bex+ae}{dx+c}\right)^2}{dx+c} - 72 i ABbe^4 \log\left(\frac{bex+ae}{dx+c}\right) - 24 i B^2 b e^4 \log\left(\frac{bex+ae}{dx+c}\right) + \frac{108 i (bex+ae) ABde^3 \log\left(\frac{bex+ae}{dx+c}\right)}{dx+c} + \frac{54 i (bex+ae)B^2de^3\log\left(\frac{bex+ae}{dx+c}\right)}{dx+c} - 36iA^2be^4 - 24iABbe^4 - 8iB^2be^4 + \frac{54i(bex+ae)A^2de^3}{dx+c} + \frac{54i(bex+ae)ABde^3}{dx+c} + \frac{27i(bex+ae)B^2de^3}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)} - \frac{ad}{(bce-ade)(bc-ad)}\right)^2}{108\left(\frac{(bex+ae)^3 bcg^4}{(dx+c)^3} - \frac{(bex+ae)^3 adg^4}{(dx+c)^3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] -1/108*(-36*I*B^2*b*e^4*log((b*x*e + a*e)/(d*x + c))^2 + 54*I*(b*x*e + a*e)
*B^2*d*e^3*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) - 72*I*A*B*b*e^4*log((b
*x*e + a*e)/(d*x + c)) - 24*I*B^2*b*e^4*log((b*x*e + a*e)/(d*x + c)) + 108*
I*(b*x*e + a*e)*A*B*d*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 54*I*(b*
x*e + a*e)*B^2*d*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 36*I*A^2*b*e^
4 - 24*I*A*B*b*e^4 - 8*I*B^2*b*e^4 + 54*I*(b*x*e + a*e)*A^2*d*e^3/(d*x + c)
 + 54*I*(b*x*e + a*e)*A*B*d*e^3/(d*x + c) + 27*I*(b*x*e + a*e)*B^2*d*e^3/(d
*x + c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a
*d)))^2/((b*x*e + a*e)^3*b*c*g^4/(d*x + c)^3 - (b*x*e + a*e)^3*a*d*g^4/(d*x
 + c)^3)
```

Mupad [B]
time = 11.45, size = 1882, normalized size = 3.71

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)^4*(c*i + d*i*x)),
x)
```

```
[Out] log((e*(a + b*x))/(c + d*x))^2*(((B^2*d^3*(a*((3*a^2*d^2 + b^2*c^2 - 4*a*b*
c*d)/(6*b*d^3) + (a*(a*d - b*c))/(3*b*d^2)) + (3*a^3*d^3 - b^3*c^3 + 4*a*b^
2*c^2*d - 6*a^2*b*c*d^2)/(3*b*d^4)))/(g^4*i*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*
c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) - (B^2*d^3*x^2*((b^2*c - a*b*d)/(
3*d^2) - (2*b*(a*d - b*c))/(3*d^2)))/(g^4*i*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*
c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) + (B^2*d^3*x*(b*((3*a^2*d^2 + b^2
*c^2 - 4*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(3*b*d^2)) + (3*a^2*d^2 + b^2
*c^2 - 4*a*b*c*d)/(3*d^3) + (2*a*(a*d - b*c))/(3*d^2)))/(g^4*i*(a^4*d^4 + b
^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)))/((3*a^2*x)/d
+ a^3/(b*d) + (b^2*x^3)/d + (3*a*b*x^2)/d) - (d^3*(11*B^2 + 6*A*B))/(6*g^4*
i*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)))
```

```
 + ((198*A^2*a^2*d^2 + 36*A^2*b^2*c^2 + 575*B^2*a^2*d^2 + 8*B^2*b^2*c^2 + 5
10*A*B*a^2*d^2 + 24*A*B*b^2*c^2 - 126*A^2*a*b*c*d - 73*B^2*a*b*c*d - 138*A*
B*a*b*c*d)/(6*(a*d - b*c)) + (x*(90*A^2*a*b*d^2 + 359*B^2*a*b*d^2 - 18*A^2*
b^2*c*d - 19*B^2*b^2*c*d + 294*A*B*a*b*d^2 - 30*A*B*b^2*c*d))/(2*(a*d - b*c
)) + (d*x^2*(18*A^2*b^2*d + 85*B^2*b^2*d + 66*A*B*b^2*d))/(a*d - b*c))/(x*(
54*a^4*b*d^2*g^4*i + 54*a^2*b^3*c^2*g^4*i - 108*a^3*b^2*c*d*g^4*i) + x^2*(5
4*a*b^4*c^2*g^4*i + 54*a^3*b^2*d^2*g^4*i - 108*a^2*b^3*c*d*g^4*i) + x^3*(18
*b^5*c^2*g^4*i + 18*a^2*b^3*d^2*g^4*i - 36*a*b^4*c*d*g^4*i) + 18*a^5*d^2*g^
4*i + 18*a^3*b^2*c^2*g^4*i - 36*a^4*b*c*d*g^4*i) - (log((e*(a + b*x))/(c +
d*x))*(x*(B^2/(g^4*i*(a*d - b*c)^2) - (d^3*(11*B^2 + 6*A*B)*(b*((3*a^2*d^2
+ b^2*c^2 - 4*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(3*b*d^2)) + (3*a^2*d^2
+ b^2*c^2 - 4*a*b*c*d)/(3*d^3) + (2*a*(a*d - b*c))/(3*d^2)))/(3*g^4*i*(a^4*
d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))) + (5*B
^2*a*d - 3*B^2*b*c)/(3*b*d*g^4*i*(a*d - b*c)^2) + (B^2*a)/(3*b*g^4*i*(a*d -
 b*c)^2) - (d^3*(11*B^2 + 6*A*B)*(a*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(6*b
*d^3) + (a*(a*d - b*c))/(3*b*d^2)) + (3*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d -
 6*a^2*b*c*d^2)/(3*b*d^4)))/(3*g^4*i*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2
 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) + (d^3*x^2*((b^2*c - a*b*d)/(3*d^2) - (2
*b*(a*d - b*c))/(3*d^2))*(11*B^2 + 6*A*B))/(3*g^4*i*(a^4*d^4 + b^4*c^4 + 6*
a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))))/((3*a^2*x)/d + a^3/(b*d
) + (b^2*x^3)/d + (3*a*b*x^2)/d) - (B^2*d^3*log((e*(a + b*x))/(c + d*x))^3)
/(3*g^4*i*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*
c*d^3)) + (d^3*atan((d^3*(A^2 + (85*B^2)/18 + (11*A*B)/3)*(18*a^4*d^4*g^4*i
 - 18*b^4*c^4*g^4*i + 36*a*b^3*c^3*d*g^4*i - 36*a^3*b*c*d^3*g^4*i)*1i)/(g^4
*i*(a*d - b*c)^4*(18*A^2*d^3 + 85*B^2*d^3 + 66*A*B*d^3)) + (b*d^4*x*(A^2 +
(85*B^2)/18 + (11*A*B)/3)*(a^3*d^3*g^4*i - b^3*c^3*g^4*i + 3*a*b^2*c^2*d*g^
4*i - 3*a^2*b*c*d^2*g^4*i)*36i)/(g^4*i*(a*d - b*c)^4*(18*A^2*d^3 + 85*B^2*d
^3 + 66*A*B*d^3)))*(A^2 + (85*B^2)/18 + (11*A*B)/3)*2i)/(g^4*i*(a*d - b*c)^
4)
```

3.92 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=722

$$\frac{2AB(bc-ad)^2g^3(a+bx)}{d^3i^2(c+dx)}-\frac{2B^2(bc-ad)^2g^3(a+bx)}{d^3i^2(c+dx)}+\frac{2B^2(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^3i^2(c+dx)}-\frac{bB(bc-ad)}{}$$

```
[Out] 2*A*B*(-a*d+b*c)^2*g^3*(b*x+a)/d^3/i^2/(d*x+c)-2*B^2*(-a*d+b*c)^2*g^3*(b*x+
a)/d^3/i^2/(d*x+c)+2*B^2*(-a*d+b*c)^2*g^3*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/d^3
/i^2/(d*x+c)-b*B*(-a*d+b*c)*g^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^3/i^2
-6*b*B*(-a*d+b*c)^2*g^3*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c))
)/d^4/i^2-3*b*(-a*d+b*c)*g^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^3/i^2-
(-a*d+b*c)^2*g^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^3/i^2/(d*x+c)+1/2*
b^3*g^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^4/i^2-3*b*(-a*d+b*c)^2*g^
3*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^4/i^2+b*B^2*(-a*
d+b*c)^2*g^3*ln(d*x+c)/d^4/i^2+b*B*(-a*d+b*c)^2*g^3*(A+B*ln(e*(b*x+a)/(d*x+
c)))*ln(1-b*(d*x+c)/d/(b*x+a))/d^4/i^2-6*b*B^2*(-a*d+b*c)^2*g^3*polylog(2,d
*(b*x+a)/b/(d*x+c))/d^4/i^2-6*b*B*(-a*d+b*c)^2*g^3*(A+B*ln(e*(b*x+a)/(d*x+c
)))*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i^2-b*B^2*(-a*d+b*c)^2*g^3*polylog(2
,b*(d*x+c)/d/(b*x+a))/d^4/i^2+6*b*B^2*(-a*d+b*c)^2*g^3*polylog(3,d*(b*x+a)/
b/(d*x+c))/d^4/i^2
```

Rubi [A]

time = 0.48, antiderivative size = 722, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 14, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2562, 2395, 2333, 2332, 2356, 2389, 2379, 2438, 2351, 31, 2355, 2354, 2421, 6724}

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^
2,x]
```

```
[Out] (2*A*B*(b*c - a*d)^2*g^3*(a + b*x))/(d^3*i^2*(c + d*x)) - (2*B^2*(b*c - a*d
)^2*g^3*(a + b*x))/(d^3*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)^2*g^3*(a + b*x)
*Log[(e*(a + b*x))/(c + d*x)])/(d^3*i^2*(c + d*x)) - (b*B*(b*c - a*d)*g^3*(
a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2) - (6*b*B*(b*c - a*
d)^2*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(d^4*i^2) - (3*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c +
 d*x)])^2)/(d^3*i^2) - ((b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2)/(d^3*i^2*(c + d*x)) + (b^3*g^3*(c + d*x)^2*(A + B*Log[(e*(
a + b*x))/(c + d*x)])^2)/(2*d^4*i^2) - (3*b*(b*c - a*d)^2*g^3*Log[(b*c - a*
```

```
d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^4*i^2) + (b*B^
2*(b*c - a*d)^2*g^3*Log[c + d*x])/(d^4*i^2) + (b*B*(b*c - a*d)^2*g^3*(A + B
*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(d^4*i
^2) - (6*b*B^2*(b*c - a*d)^2*g^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(
d^4*i^2) - (6*b*B*(b*c - a*d)^2*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Po
lyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2) - (b*B^2*(b*c - a*d)^2*g^3
*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^
2*g^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
```

```
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(92c+92dx)^2}\,dx = \int \left(-\frac{b^2(2bc-3ad)g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x\left(A+\right.}{8}\right.$$

$$=\frac{(b^3g^3)\int x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx}{8464d^2}-\frac{(b^2(2bc-3ad)g^3)\int\left(\right.}{84}$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x^2\left(A+B\,\mathrm{lo}\right.}{1692}$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x^2\left(A+B\,\mathrm{lo}\right.}{1692}$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x^2\left(A+B\,\mathrm{lo}\right.}{1692}$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x^2\left(A+B\,\mathrm{lo}\right.}{1692}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}-\frac{B(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4232d^4(c+dx)}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}-\frac{bB^2(bc-ad)g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{8464d^3}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}-\frac{bB^2(bc-ad)g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{8464d^3}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log}{4232d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log}{4232d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log}{4232d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log}{4232d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log}{4232d^4}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 5193 vs. $2(722) = 1444$.
time = 6.93, size = 5193, normalized size = 7.19

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x)^2,x]
```

```
[Out] Result too large to show
```

Maple [F]
time = 0.31, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^3\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] -1/2*(2*c^3/(d^5*x + c*d^4) + 6*c^2*log(d*x + c)/d^4 + (d*x^2 - 4*c*x)/d^3)
*A^2*b^3*g^3 + 3*A^2*a*b^2*(c^2/(d^4*x + c*d^3) - x/d^2 + 2*c*log(d*x + c)/
d^3)*g^3 - 2*A*B*a^3*g^3*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(
b*c*d - a*d^2) - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(d^2*x + c*d) + 1/(d^
2*x + c*d)) - 3*A^2*a^2*b*g^3*(c/(d^3*x + c*d^2) + log(d*x + c)/d^2) + A^2*
a^3*g^3/(d^2*x + c*d) - 1/2*(2*((b^3*c^2*d*g^3 - 2*a*b^2*c*d^2*g^3 + a^2*b*
d^3*g^3)*B^2*x + (b^3*c^3*g^3 - 2*a*b^2*c^2*d*g^3 + a^2*b*c*d^2*g^3)*B^2)*l
og(d*x + c)^3 + (B^2*b^3*d^3*g^3*x^3 - 3*(b^3*c*d^2*g^3 - 2*a*b^2*d^3*g^3)*
B^2*x^2 - 2*(2*b^3*c^2*d*g^3 - 3*a*b^2*c*d^2*g^3)*B^2*x + 2*(b^3*c^3*g^3 -
3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*B^2)*log(d*x + c)^2)/(
d^5*x + c*d^4) + integrate(-(B^2*a^3*d^3*g^3 + (2*A*B*b^3*d^3*g^3 + B^2*b^3
*d^3*g^3)*x^3 + 3*(2*A*B*a*b^2*d^3*g^3 + B^2*a*b^2*d^3*g^3)*x^2 + (B^2*b^3*
d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3
```

```
*g^3)*log(b*x + a)^2 + 3*(2*A*B*a^2*b*d^3*g^3 + B^2*a^2*b*d^3*g^3)*x + 2*(B
^2*a^3*d^3*g^3 + (A*B*b^3*d^3*g^3 + B^2*b^3*d^3*g^3)*x^3 + 3*(A*B*a*b^2*d^3
*g^3 + B^2*a*b^2*d^3*g^3)*x^2 + 3*(A*B*a^2*b*d^3*g^3 + B^2*a^2*b*d^3*g^3)*x
)*log(b*x + a) - ((2*A*B*b^3*d^3*g^3 + 3*B^2*b^3*d^3*g^3)*x^3 + 2*(b^3*c^3*
g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3)*B^2 + 3*(2*A*B*a*b^2*d^3*g^3 -
 (b^3*c*d^2*g^3 - 4*a*b^2*d^3*g^3)*B^2)*x^2 + 2*(3*A*B*a^2*b*d^3*g^3 - (2*b
^3*c^2*d*g^3 - 3*a*b^2*c*d^2*g^3 - 3*a^2*b*d^3*g^3)*B^2)*x + 2*(B^2*b^3*d^3
*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^
3)*log(b*x + a))*log(d*x + c))/(d^5*x^2 + 2*c*d^4*x + c^2*d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] integral(-(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*
a^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*
a^3*g^3)*log((b*x + a)*e/(d*x + c))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^
3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log((b*x + a)*e/(d*x + c)))/(d^2*x
^2 + 2*c*d*x + c^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(I*d*x + I*c
)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{(c\,i+d\,i\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^
2,x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^
2, x)
```

3.93 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=469

$$-\frac{2AB(bc-ad)g^2(a+bx)}{d^2i^2(c+dx)}+\frac{2B^2(bc-ad)g^2(a+bx)}{d^2i^2(c+dx)}-\frac{2B^2(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^2i^2(c+dx)}+\frac{2bB(bc-ad)}{}$$

```
[Out] -2*A*B*(-a*d+b*c)*g^2*(b*x+a)/d^2/i^2/(d*x+c)+2*B^2*(-a*d+b*c)*g^2*(b*x+a)/
d^2/i^2/(d*x+c)-2*B^2*(-a*d+b*c)*g^2*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/d^2/i^2/
(d*x+c)+2*b*B*(-a*d+b*c)*g^2*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*
x+c)))/d^3/i^2+b*g^2*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^2/i^2+(-a*d+b*
c)*g^2*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^2/i^2/(d*x+c)+2*b*(-a*d+b*c)
*g^2*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^3/i^2+2*b*B^2
*(-a*d+b*c)*g^2*polylog(2,d*(b*x+a)/b/(d*x+c))/d^3/i^2+4*b*B*(-a*d+b*c)*g^2
*(A+B*ln(e*(b*x+a)/(d*x+c)))*polylog(2,d*(b*x+a)/b/(d*x+c))/d^3/i^2-4*b*B^2
*(-a*d+b*c)*g^2*polylog(3,d*(b*x+a)/b/(d*x+c))/d^3/i^2
```

Rubi [A]
time = 0.31, antiderivative size = 469, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {2562, 2395, 2333, 2332, 2355, 2354, 2438, 2421, 6724}

$$\frac{4bBg^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^2}+\frac{2bB^2g^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}-\frac{4bB^2g^2(bc-ad)\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}+\frac{2bg^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^3i^2}+\frac{2bBg^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^2}+\frac{bg^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^2i^2}+\frac{g^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^2i^2(c+dx)}-\frac{2ABg^2(a+bx)(bc-ad)}{d^2i^2(c+dx)}-\frac{2B^2g^2(a+bx)(bc-ad)\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^2i^2(c+dx)}+\frac{2B^2g^2(a+bx)(bc-ad)}{d^2i^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^
2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)
*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) - (2*B^2*(b*c - a*d)*g^2*(a + b*x)*Log[
(e*(a + b*x))/(c + d*x)])/(d^2*i^2*(c + d*x)) + (2*b*B*(b*c - a*d)*g^2*Log[
(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2)
 + (b*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^2) + ((b*
c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^2*(c
 + d*x)) + (2*b*(b*c - a*d)*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^2)/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*PolyLog[2,
(d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2) + (4*b*B*(b*c - a*d)*g^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^
2) - (4*b*B^2*(b*c - a*d)*g^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3
*i^2)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(93c+93dx)^2}\,dx = \int \left(\frac{b^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} + \frac{(-bc+ad)^2g^2\left(A+B\log\left(\right.\right.}{8649d^2(c+dx)^2}\right.$$

$$= \frac{(b^2g^2)\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{8649d^2} - \frac{(2b(bc-ad)g^2)\int \frac{\left(A+B\log\right.}{}}{8649d^2}$$

$$= \frac{b^2g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{8649d^3(c+dx)}$$

$$= \frac{b^2g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{8649d^3(c+dx)}$$

$$= \frac{b^2g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{8649d^3(c+dx)}$$

$$= \frac{b^2g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{8649d^3(c+dx)}$$

$$= \frac{2B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8649d^3(c+dx)} + \frac{2abBg^2\log(a+bx)\left(\right.}{8649}$$

$$= \frac{2B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8649d^3(c+dx)} + \frac{2abBg^2\log(a+bx)\left(\right.}{8649}$$

$$= \frac{2B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8649d^3(c+dx)} + \frac{2abBg^2\log(a+bx)\left(\right.}{8649}$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} + \frac{2B(bc-a}{}$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} + \frac{2B(bc-a}{}$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} - \frac{abB^2g^2\log}{864}$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} - \frac{abB^2g^2\log}{864}$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} - \frac{abB^2g^2\log}{864}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1969 vs. 2(469) = 938.
time = 2.40, size = 1969, normalized size = 4.20

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x)^2,x]
```

```
[Out] (g^2*(A^2*b^2*d*x - (A^2*(b*c - a*d)^2)/(c + d*x) + 2*A^2*b*(-(b*c) + a*d)*
Log[c + d*x] + (2*a^2*A*B*d^2*(b*c - a*d + b*(c + d*x)*Log[a/b + x] + (-(b*
c) + a*d)*Log[(e*(a + b*x))/(c + d*x)] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]
 - b*d*x*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)*(c + d*x)) + 2*a*A*b
*B*d*(-Log[c/d + x]^2 + 2*Log[c/d + x]*Log[c + d*x] + 2*(-(c/(c + d*x)) + (
b*c*Log[a + b*x])/(-(b*c) + a*d) + (b*c*Log[c + d*x])/(b*c - a*d) - Log[a/b
 + x]*Log[c + d*x] + Log[(e*(a + b*x))/(c + d*x)]*(c/(c + d*x) + Log[c + d*
x]) + Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)]) + 2*A*b^2*B*(d*(a/b + x)*(-1 + Log[a/b + x]) - (c^2*L
og[a/b + x])/(c + d*x) - (c + d*x)*(-1 + Log[c/d + x]) + c*Log[c/d + x]^2 +
 (c^2*(1 + Log[c/d + x]))/(c + d*x) + (b*c^2*(Log[a + b*x] - Log[c + d*x]))
/(b*c - a*d) + (-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)]
)*(d*x - c^2/(c + d*x) - 2*c*Log[c + d*x]) - 2*c*(Log[a/b + x]*Log[(b*(c +
d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) - (a^2*B^2*
d^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a +
 b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]
 + (b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*b*(c + d*x)*Log[c + d*x]
- 2*b*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)]
 + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d
)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c -
 a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)
/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*
(c + d*x)) + b^2*B^2*((d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2)/b - (c^2
*Log[(e*(a + b*x))/(c + d*x)]^2)/(c + d*x) + 2*c*Log[(e*(a + b*x))/(c + d*x
)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (c^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*L
og[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Lo
g[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*
(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(
c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) -
2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/
(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c
+ b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d
*x)) - ((b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-
(b*c) + a*d)] - 2*Log[(e*(a + b*x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d
*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b + 4*c*(Log[(e*(a + b*x)
```

```
)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b
*x))/(b*(c + d*x))])) + 2*a*b*B^2*d*((c*Log[(e*(a + b*x))/(c + d*x)]^2)/(c
+ d*x) - Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*
Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(
2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x)
)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*
b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(
b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log
[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
+ b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])))/((b*c - a*d)*(c + d*x)) + 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*
x))])))/(d^3*i^2)
```

Maple [F]
time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx+ag\right)^{2} \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^{2}}{\left(dix+ci\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] A^2*b^2*(c^2/(d^4*x + c*d^3) - x/d^2 + 2*c*log(d*x + c)/d^3)*g^2 - 2*A*B*a^
2*g^2*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^2) - lo
g(b*x*e/(d*x + c) + a*e/(d*x + c))/(d^2*x + c*d) + 1/(d^2*x + c*d)) - 2*A^2
*a*b*g^2*(c/(d^3*x + c*d^2) + log(d*x + c)/d^2) + A^2*a^2*g^2/(d^2*x + c*d)
 + 1/3*(2*((b^2*c*d*g^2 - a*b*d^2*g^2)*B^2*x + (b^2*c^2*g^2 - a*b*c*d*g^2)*
B^2)*log(d*x + c)^3 - 3*(B^2*b^2*d^2*g^2*x^2 + B^2*b^2*c*d*g^2*x - (b^2*c^2
*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*B^2)*log(d*x + c)^2)/(d^4*x + c*d^3) +
integrate(-(B^2*a^2*d^2*g^2 + (2*A*B*b^2*d^2*g^2 + B^2*b^2*d^2*g^2)*x^2 + (
B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log(b*x + a)^2
 + 2*(2*A*B*a*b*d^2*g^2 + B^2*a*b*d^2*g^2)*x + 2*(B^2*a^2*d^2*g^2 + (A*B*b^
2*d^2*g^2 + B^2*b^2*d^2*g^2)*x^2 + 2*(A*B*a*b*d^2*g^2 + B^2*a*b*d^2*g^2)*x)
```

```
*log(b*x + a) + 2*((b^2*c^2*g^2 - 2*a*b*c*d*g^2)*B^2 - (A*B*b^2*d^2*g^2 + 2
*B^2*b^2*d^2*g^2)*x^2 - (2*A*B*a*b*d^2*g^2 + (b^2*c*d*g^2 + 2*a*b*d^2*g^2)*
B^2)*x - (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log(
b*x + a))*log(d*x + c))/(d^4*x^2 + 2*c*d^3*x + c^2*d^2), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] integral(-(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x
^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b*x + a)*e/(d*x + c))^2 + 2*(A*B*b
^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log((b*x + a)*e/(d*x + c)))/(d^
2*x^2 + 2*c*d*x + c^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(I*d*x + I*c
)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}{{\left(c\,i+d\,i\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^
2,x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^
2, x)
```

3.94 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=261

$$\frac{2ABg(a+bx)}{di^2(c+dx)}-\frac{2B^2g(a+bx)}{di^2(c+dx)}+\frac{2B^2g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{di^2(c+dx)}-\frac{g(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{di^2(c+dx)}-\frac{bg\log\left(\frac{b\ldots}{b(\ldots}\right.}{}$$

```
[Out] 2*A*B*g*(b*x+a)/d/i^2/(d*x+c)-2*B^2*g*(b*x+a)/d/i^2/(d*x+c)+2*B^2*g*(b*x+a)
*ln(e*(b*x+a)/(d*x+c))/d/i^2/(d*x+c)-g*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^
2/d/i^2/(d*x+c)-b*g*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/
d^2/i^2-2*b*B*g*(A+B*ln(e*(b*x+a)/(d*x+c)))*polylog(2,d*(b*x+a)/b/(d*x+c))/
d^2/i^2+2*b*B^2*g*polylog(3,d*(b*x+a)/b/(d*x+c))/d^2/i^2
```

Rubi [A]
time = 0.18, antiderivative size = 261, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$, Rules used = {2562, 2395, 2333, 2332, 2354, 2421, 6724}

$$-\frac{2bBg\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^2}+\frac{2bB^2g\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2}-\frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^2i^2}-\frac{g(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{di^2(c+dx)}+\frac{2ABg(a+bx)}{di^2(c+dx)}+\frac{2B^2g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{di^2(c+dx)}-\frac{2B^2g(a+bx)}{di^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^2,
x]
```

```
[Out] (2*A*B*g*(a + b*x))/(d*i^2*(c + d*x)) - (2*B^2*g*(a + b*x))/(d*i^2*(c + d*x
)) + (2*B^2*g*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(d*i^2*(c + d*x)) - (
g*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d*i^2*(c + d*x)) - (b*
g*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d
^2*i^2) - (2*b*B*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a +
b*x))/(b*(c + d*x))])/(d^2*i^2) + (2*b*B^2*g*PolyLog[3, (d*(a + b*x))/(b*(c
 + d*x))])/(d^2*i^2)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(94c+94dx)^2}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d(c+dx)^2} + \frac{bg\left(A+B\log\left(\frac{e(a-}{c+}\right.\right.}{8836d(c+dx}\right.$$

$$= \frac{(bg)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{8836d} - \frac{((bc-ad)g)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^2}}{8836d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2}$$

$$= -\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2(c+dx)} - \frac{bBg\log(a+bx)\left(A+\right.}{4418d^2}$$

$$= -\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2(c+dx)} - \frac{bBg\log(a+bx)\left(A+\right.}{4418d^2}$$

$$= -\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2(c+dx)} - \frac{bBg\log(a+bx)\left(A+\right.}{4418d^2}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} - \frac{B(bc-ad)g\left(A+B\log\right.}{4418d^2(c+dx}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} - \frac{B(bc-ad)g\left(A+B\log\right.}{4418d^2(c+dx}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} + \frac{bB^2g\log^2(a+bx)}{8836d^2} - \frac{B(}{}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} + \frac{bB^2g\log^2(a+bx)}{8836d^2} - \frac{B(}{}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} + \frac{bB^2g\log^2(a+bx)}{8836d^2} - \frac{B(}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1107 vs. $2(261) = 522$.
time = 1.05, size = 1107, normalized size = 4.24

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i
*x)^2,x]
```

```
[Out] (g*((A^2*(b*c - a*d))/(c + d*x) + A^2*b*Log[c + d*x] + (2*a*A*B*d*(b*c - a*
d + b*(c + d*x)*Log[a/b + x] + (-(b*c) + a*d)*Log[(e*(a + b*x))/(c + d*x)]
- b*c*Log[(b*(c + d*x))/(b*c - a*d)] - b*d*x*Log[(b*(c + d*x))/(b*c - a*d)]
))/((b*c - a*d)*(c + d*x)) + A*b*B*(-Log[c/d + x]^2 + 2*Log[c/d + x]*Log[c
+ d*x] + 2*(-(c/(c + d*x)) + (b*c*Log[a + b*x])/(-(b*c) + a*d) + (b*c*Log[c
 + d*x])/(b*c - a*d) - Log[a/b + x]*Log[c + d*x] + Log[(e*(a + b*x))/(c + d
*x)]*(c/(c + d*x) + Log[c + d*x]) + Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a
*d)]) + 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - (a*B^2*d*(2*b*c - 2*a
*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)
] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + (b*c - a*d)*L
og[(e*(a + b*x))/(c + d*x)]^2 - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*
Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(
Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[
2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d
*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)])
 - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x)) + b*B
^2*((c*Log[(e*(a + b*x))/(c + d*x)]^2)/(c + d*x) - Log[(e*(a + b*x))/(c + d
*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*Log[(e*(a + b*x))/(c + d*x)]*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log
[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[
a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c
 + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c
+ d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*
PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b
*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c +
b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x
)) + 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^2*i^2)
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(bgx + ag)\left(A + B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{(dix + ci)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] -2*A*B*a*g*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^2)
 - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(d^2*x + c*d) + 1/(d^2*x + c*d)) -
A^2*b*g*(c/(d^3*x + c*d^2) + log(d*x + c)/d^2) + A^2*a*g/(d^2*x + c*d) - 1/
3*(3*(b*c*g - a*d*g)*B^2*log(d*x + c)^2 + (B^2*b*d*g*x + B^2*b*c*g)*log(d*x
 + c)^3)/(d^3*x + c*d^2) + integrate(-(B^2*a*d*g + (B^2*b*d*g*x + B^2*a*d*g
)*log(b*x + a)^2 + (2*A*B*b*d*g + B^2*b*d*g)*x + 2*(B^2*a*d*g + (A*B*b*d*g
+ B^2*b*d*g)*x)*log(b*x + a) - 2*(B^2*b*c*g + (A*B*b*d*g + B^2*b*d*g)*x + (
B^2*b*d*g*x + B^2*a*d*g)*log(b*x + a))*log(d*x + c))/(d^3*x^2 + 2*c*d^2*x +
 c^2*d), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] integral(-(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b*x + a)*e/(d*x
 + c))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b*x + a)*e/(d*x + c)))/(d^2*x^2 + 2
*c*d*x + c^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(I*d*x + I*c)^
2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{(c\,i+d\,i\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^2,
x)
```

```
[Out] int(((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^2,
 x)
```

3.95 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=152

$$-\frac{2AB(a+bx)}{(bc-ad)i^2(c+dx)}+\frac{2B^2(a+bx)}{(bc-ad)i^2(c+dx)}-\frac{2B^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(bc-ad)i^2(c+dx)}+\frac{(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(bc-ad)i^2(c+dx)}$$

```
[Out] -2*A*B*(b*x+a)/(-a*d+b*c)/i^2/(d*x+c)+2*B^2*(b*x+a)/(-a*d+b*c)/i^2/(d*x+c)-
2*B^2*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/(-a*d+b*c)/i^2/(d*x+c)+(b*x+a)*(A+B*ln(
e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)/i^2/(d*x+c)
```

Rubi [A]
time = 0.05, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2552, 2333, 2332}

$$\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{i^2(c+dx)(bc-ad)}-\frac{2AB(a+bx)}{i^2(c+dx)(bc-ad)}-\frac{2B^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{i^2(c+dx)(bc-ad)}+\frac{2B^2(a+bx)}{i^2(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x)^2,x]
```

```
[Out] (-2*A*B*(a + b*x))/((b*c - a*d)*i^2*(c + d*x)) + (2*B^2*(a + b*x))/((b*c -
a*d)*i^2*(c + d*x)) - (2*B^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c
- a*d)*i^2*(c + d*x)) + ((a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
((b*c - a*d)*i^2*(c + d*x))
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2552

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(
m + 1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a
 + b*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && EqQ[n
```

```
 + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d, 0] && IntegersQ[m, p] && EqQ[d*f
- c*g, 0] && (GtQ[p, 0] || LtQ[m, -1])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(95c+95dx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)} + \frac{(2B)\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{95(a+bx)(c+dx)^2}\,dx}{95d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)^2}\,dx}{9025d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)} + \frac{(2B(bc-ad))\int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)} - \frac{d\left(A+B\,\mathrm{l}\right.}{(bc-a}\right.}{9025d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)} - \frac{(2B)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}\,dx}{9025} - \frac{(2bB)\int \frac{A+B\log\left(\frac{e(a}{c}\right.}{c+dx}}{9025(bc-a}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc-ad)} - \frac{(A}{}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc-ad)} - \frac{(A}{}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc-ad)} - \frac{(A}{}$$

$$= -\frac{2B^2}{9025d(c+dx)} - \frac{2bB^2\log(a+bx)}{9025d(bc-ad)} + \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log}{}$$

$$= -\frac{2B^2}{9025d(c+dx)} - \frac{2bB^2\log(a+bx)}{9025d(bc-ad)} + \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log}{}$$

$$= -\frac{2B^2}{9025d(c+dx)} - \frac{2bB^2\log(a+bx)}{9025d(bc-ad)} - \frac{bB^2\log^2(a+bx)}{9025d(bc-ad)} + \frac{2B\left(A+B\log\right.}{9025d(c+}$$

$$= -\frac{2B^2}{9025d(c+dx)} - \frac{2bB^2\log(a+bx)}{9025d(bc-ad)} - \frac{bB^2\log^2(a+bx)}{9025d(bc-ad)} + \frac{2B\left(A+B\log\right.}{9025d(c+}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.30, size = 315, normalized size = 2.07

$$\frac{-\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{B\left(2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+2b(c+dx)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-2b(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)-2B(bc-ad+b(c+dx)\log(a+bx)-b(c+dx)\log(c+dx))-bB(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+bB(c+dx)\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{bc-ad}}{di^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x)^2,x]
```

```
[Out] (-(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*(b*c - a*d)*(A + B*Log[(e*
(a + b*x))/(c + d*x)]) + 2*b*(c + d*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]) - 2*b*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c +
d*x] - 2*B*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]
) - b*B*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*(c + d*x)*((2*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2,
 (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(d*i^2*(c + d*x))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 340 vs. $2(152) = 304$.

time = 0.57, size = 341, normalized size = 2.24

method	result
norman	$\frac{\frac{\left(A^2-2AB+2B^2\right)x}{ic}-\frac{B^2 a\ln\left(\frac{e(bx+a)}{dx+c}\right)^2}{i(ad-cb)}-\frac{B^2 bx\ln\left(\frac{e(bx+a)}{dx+c}\right)^2}{(ad-cb)i}-\frac{2aB(A-B)\ln\left(\frac{e(bx+a)}{dx+c}\right)}{i(ad-cb)}-\frac{2Bb(A-B)x\ln\left(\frac{e(bx+a)}{dx+c}\right)}{i(ad-cb)}}{i(dx+c)}$
derivativedivides	$-\frac{e(ad-cb)\left(\frac{d^2A^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)^2e^2i^2}+\frac{2d^2AB\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)-\frac{(ad-cb)e}{d(dx+c)}-\frac{be}{d}\right)}{(ad-cb)^2e^2i^2}+\frac{d^2B^2\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right.\right.}{}\right.}{d^2}$
default	$-\frac{e(ad-cb)\left(\frac{d^2A^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{(ad-cb)^2e^2i^2}+\frac{2d^2AB\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)-\frac{(ad-cb)e}{d(dx+c)}-\frac{be}{d}\right)}{(ad-cb)^2e^2i^2}+\frac{d^2B^2\left(\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right.\right.}{}\right.}{d^2}$
risch	$-\frac{A^2}{i^2(dx+c)d}-\frac{B^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2 b}{i^2(ad-cb)d}-\frac{B^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2 a}{i^2(ad-cb)(dx+c)}+\frac{B^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2 cb}{i^2(ad-cb)d(dx+c)}+\frac{2B^2\ln\left(\frac{be}{d}+\frac{(a}{d(}\right.}{i^2(ad-cb}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(d^2/(a*d-b*c)^2/e^2/i^2*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c
))+2*d^2/(a*d-b*c)^2/e^2/i^2*A*B*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d)+d^2/(a*d-b*c)^2/e^2/i^2*B
^2*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*c)*e/d/(d
*x+c)+2*b*e/d))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 366 vs. $2(143) = 286$.

time = 0.28, size = 366, normalized size = 2.41

$$-\left(2\left(\frac{b\log\left(bx+a\right)}{bcd-ad^2}-\frac{b\log\left(dx+c\right)}{bcd-ad^2}+\frac{1}{d^2x+cd}\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)-\frac{(bdx+bc)\log\left(bx+a\right)^2+(bdx+bc)\log\left(dx+c\right)^2+2\,bc-2\,ad+2\,(bdx+bc)\log\left(bx+a\right)-2\,(bdx+bc+(bdx+bc)\log\left(bx+a\right))\log\left(dx+c\right)}{bc^2d-acd^2+(bcd^2-ad^3)x}\right)B^2-2\,AB\left(\frac{b\log\left(bx+a\right)}{bcd-ad^2}-\frac{b\log\left(dx+c\right)}{bcd-ad^2}-\frac{\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)}{d^2x+cd}+\frac{1}{d^2x+cd}\right)+\frac{B^2\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)^2}{d^2x+cd}+\frac{A^2}{d^2x+cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algorithm="maxima
")
```

```
[Out] -(2*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^2) + 1/(d
^2*x + c*d))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - ((b*d*x + b*c)*log(b*x
+ a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log
(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))/(b*c
^2*d - a*c*d^2 + (b*c*d^2 - a*d^3)*x))*B^2 - 2*A*B*(b*log(b*x + a)/(b*c*d -
 a*d^2) - b*log(d*x + c)/(b*c*d - a*d^2) - log(b*x*e/(d*x + c) + a*e/(d*x +
 c))/(d^2*x + c*d) + 1/(d^2*x + c*d)) + B^2*log(b*x*e/(d*x + c) + a*e/(d*x
+ c))^2/(d^2*x + c*d) + A^2/(d^2*x + c*d)
```

Fricas [A]
time = 0.43, size = 144, normalized size = 0.95

$$\frac{(A^2-2\,AB+2\,B^2)bc-(A^2-2\,AB+2\,B^2)ad-(B^2bdx+B^2ad)\log\left(\frac{(bx+a)e}{dx+c}\right)^2-2\,((AB-B^2)bdx+(AB-B^2)ad)\log\left(\frac{(bx+a)e}{dx+c}\right)}{bc^2d-acd^2+(bcd^2-ad^3)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algorithm="fricas
")
```

```
[Out] ((A^2 - 2*A*B + 2*B^2)*b*c - (A^2 - 2*A*B + 2*B^2)*a*d - (B^2*b*d*x + B^2*a
*d)*log((b*x + a)*e/(d*x + c))^2 - 2*((A*B - B^2)*b*d*x + (A*B - B^2)*a*d)*
log((b*x + a)*e/(d*x + c)))/(b*c^2*d - a*c*d^2 + (b*c*d^2 - a*d^3)*x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 432 vs. 2(128) = 256.
time = 1.47, size = 432, normalized size = 2.84

$$\frac{2Bb(A-B)\log\left(x+\frac{2ABabd+2ABb^2c-2B^2abd-2B^2b^2c-\frac{2Ba^2bd^2(A-B)}{ad-bc}+\frac{4Bab^2cd(A-B)}{ad-bc}-\frac{2Bb^3c^2(A-B)}{ad-bc}}{4ABb^2d-4B^2b^2d}\right)}{di^2\left(ad-bc\right)}-\frac{2Bb(A-B)\log\left(x+\frac{2ABabd+2ABb^2c-2B^2abd-2B^2b^2c+\frac{2Ba^2bd^2(A-B)}{ad-bc}-\frac{4Bab^2cd(A-B)}{ad-bc}+\frac{2Bb^3c^2(A-B)}{ad-bc}}{4ABb^2d-4B^2b^2d}\right)}{di^2\left(ad-bc\right)}+\frac{(-2AB+2B^2)\log\left(\frac{e(a+bx)}{c+dx}\right)}{cdi^2+d^2i^2x}+\frac{(-B^2a-B^2bx)\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{acdi^2+ad^2i^2x-bc^2i^2-bcdi^2x}+\frac{-A^2+2AB-2B^2}{cdi^2+d^2i^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**2,x)
```

```
[Out] 2*B*b*(A - B)*log(x + (2*A*B*a*b*d + 2*A*B*b**2*c - 2*B**2*a*b*d - 2*B**2*b
**2*c - 2*B*a**2*b*d**2*(A - B)/(a*d - b*c) + 4*B*a*b**2*c*d*(A - B)/(a*d -
 b*c) - 2*B*b**3*c**2*(A - B)/(a*d - b*c))/(4*A*B*b**2*d - 4*B**2*b**2*d))/
(d*i**2*(a*d - b*c)) - 2*B*b*(A - B)*log(x + (2*A*B*a*b*d + 2*A*B*b**2*c -
2*B**2*a*b*d - 2*B**2*b**2*c + 2*B*a**2*b*d**2*(A - B)/(a*d - b*c) - 4*B*a*
b**2*c*d*(A - B)/(a*d - b*c) + 2*B*b**3*c**2*(A - B)/(a*d - b*c))/(4*A*B*b*
```

```
*2*d - 4*B**2*b**2*d))/(d*i**2*(a*d - b*c)) + (-2*A*B + 2*B**2)*log(e*(a +
b*x)/(c + d*x))/(c*d*i**2 + d**2*i**2*x) + (-B**2*a - B**2*b*x)*log(e*(a +
b*x)/(c + d*x))**2/(a*c*d*i**2 + a*d**2*i**2*x - b*c**2*i**2 - b*c*d*i**2*x
) + (-A**2 + 2*A*B - 2*B**2)/(c*d*i**2 + d**2*i**2*x)
```

Giac [A]
time = 3.60, size = 179, normalized size = 1.18

$$-\left(\frac{(bxe+ae)B^2\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+\frac{2\,(bxe+ae)(AB-B^2)\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{(bxe+ae)(A^2-2\,AB+2\,B^2)}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] -((b*x*e + a*e)*B^2*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 2*(b*x*e + a
*e)*(A*B - B^2)*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + (b*x*e + a*e)*(A^2
 - 2*A*B + 2*B^2)/(d*x + c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c
*e - a*d*e)*(b*c - a*d)))
```

Mupad [B]
time = 5.62, size = 222, normalized size = 1.46

$$\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\,\left(\frac{2\,B^2}{b\,d^2\,i^2}-\frac{2\,A\,B}{b\,d^2\,i^2}\right)}{\frac{x}{b}+\frac{c}{b\,d}}-\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2\,\left(\frac{B^2}{d^2\,i^2\,\left(x+\frac{c}{d}\right)}+\frac{B^2\,b}{d\,i^2\,\left(a\,d-b\,c\right)}\right)-\frac{A^2-2\,A\,B+2\,B^2}{x\,d^2\,i^2+c\,d\,i^2}+\frac{B\,b\,\mathrm{atan}\left(\frac{\left(2\,b\,d\,x+\frac{a\,d^2\,i^2+b\,c\,d\,i^2}{d\,i^2}\right)\,1{}\mathrm{i}}{a\,d-b\,c}\right)\,\left(A-B\right)\,4{}\mathrm{i}}{d\,i^2\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(c*i + d*i*x)^2,x)
```

```
[Out] (log((e*(a + b*x))/(c + d*x))*((2*B^2)/(b*d^2*i^2) - (2*A*B)/(b*d^2*i^2)))/
(x/b + c/(b*d)) - log((e*(a + b*x))/(c + d*x))^2*(B^2/(d^2*i^2*(x + c/d)) +
 (B^2*b)/(d*i^2*(a*d - b*c))) - (A^2 + 2*B^2 - 2*A*B)/(d^2*i^2*x + c*d*i^2)
 + (B*b*atan(((2*b*d*x + (a*d^2*i^2 + b*c*d*i^2)/(d*i^2))*1i)/(a*d - b*c))*
(A - B)*4i)/(d*i^2*(a*d - b*c))
```

3.96 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)^2}\,dx$

Optimal. Leaf size=214

$$\frac{2ABd(a+bx)}{(bc-ad)^2gi^2(c+dx)}-\frac{2B^2d(a+bx)}{(bc-ad)^2gi^2(c+dx)}+\frac{2B^2d(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(bc-ad)^2gi^2(c+dx)}-\frac{d(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2gi^2(c+dx)}$$

```
[Out] 2*A*B*d*(b*x+a)/(-a*d+b*c)^2/g/i^2/(d*x+c)-2*B^2*d*(b*x+a)/(-a*d+b*c)^2/g/i
^2/(d*x+c)+2*B^2*d*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/(-a*d+b*c)^2/g/i^2/(d*x+c)
-d*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^2/g/i^2/(d*x+c)+1/3*b*(
A+B*ln(e*(b*x+a)/(d*x+c)))^3/B/(-a*d+b*c)^2/g/i^2
```

Rubi [A]
time = 0.17, antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2562, 2388, 2339, 30, 2333, 2332}

$$\frac{b\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bgi^2(bc-ad)^2}-\frac{d(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{gi^2(c+dx)(bc-ad)^2}+\frac{2ABd(a+bx)}{gi^2(c+dx)(bc-ad)^2}+\frac{2B^2d(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{gi^2(c+dx)(bc-ad)^2}-\frac{2B^2d(a+bx)}{gi^2(c+dx)(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*x)^2),
x]
```

```
[Out] (2*A*B*d*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) - (2*B^2*d*(a + b*x))/(
(b*c - a*d)^2*g*i^2*(c + d*x)) + (2*B^2*d*(a + b*x)*Log[(e*(a + b*x))/(c +
d*x)])/((b*c - a*d)^2*g*i^2*(c + d*x)) - (d*(a + b*x)*(A + B*Log[(e*(a + b*
x))/(c + d*x)])^2)/((b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*Log[(e*(a +
b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^2*g*i^2)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
```

```
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2388

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[(d + e*x)^(q - 1)*((a + b*Log[c*x^n])^p/x),
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(96c+96dx)^2(ag+bgx)}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)^2} - \frac{bd\left(A+B\log\right.}{9216(bc-a}\right.$$

$$= \frac{b^2\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{9216(bc-ad)^2g} - \frac{(bd)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{9216(bc-ad)^2g} - \frac{d\int \frac{\left(A+B\log\left(\frac{e(a+}{c+}\right.\right.}{(c+dx)^2}}{9216(bc-}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g} - \frac{b\left(A+\right.}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g} - \frac{b\left(A+\right.}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g} - \frac{b\left(A+\right.}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g} - \frac{b\left(A+\right.}{}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)^2g} + \frac{\left(A\right.}{921}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)^2g} + \frac{\left(A\right.}{921}$$

$$= -\frac{bB^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9216(bc-ad)^2g} - \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)g(c+dx)} - \frac{bB\log(a+}{4}$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{bB^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a}{c-}\right.}{9216(bc-ad)^2g}$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} - \frac{bB^2\log}{}$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} + \frac{bB^2\log}{9216(b}$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} + \frac{bB^2\log}{9216(b}$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} + \frac{bB^2\log}{9216(b}$$

Mathematica [A]
time = 0.39, size = 187, normalized size = 0.87

$$\frac{3b(A^2-2AB+2B^2)(c+dx)\log(a+bx)+6(A-B)B(bc-ad)\log\left(\frac{e(a+bx)}{c+dx}\right)+3B(-Bd(a+bx)+Ab(c+dx))\log^2\left(\frac{e(a+bx)}{c+dx}\right)+bB^2(c+dx)\log^3\left(\frac{e(a+bx)}{c+dx}\right)-3(A^2-2AB+2B^2)(-bc+ad+b(c+dx)\log(c+dx))}{3(bc-ad)^2gi^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*
x)^2),x]
```

```
[Out] (3*b*(A^2 - 2*A*B + 2*B^2)*(c + d*x)*Log[a + b*x] + 6*(A - B)*B*(b*c - a*d)
*Log[(e*(a + b*x))/(c + d*x)] + 3*B*(-(B*d*(a + b*x)) + A*b*(c + d*x))*Log[
(e*(a + b*x))/(c + d*x)]^2 + b*B^2*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^3
 - 3*(A^2 - 2*A*B + 2*B^2)*(-(b*c) + a*d + b*(c + d*x)*Log[c + d*x]))/(3*(b
*c - a*d)^2*g*i^2*(c + d*x))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 520 vs. $2(212) = 424$.
time = 0.67, size = 521, normalized size = 2.43 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-d^2/e/i^2/(a*d-b*c)^3/g*A^2*b*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))+d^3/e^2/i^2/(a*d-b*c)^3/g*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-d^2/e/i
^2/(a*d-b*c)^3/g*A*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+2*d^3/e^2/i^2/(a*d
-b*c)^3/g*A*B*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)-(a*d-b*c)*e/d/(d*x+c)-b*e/d)-1/3*d^2/e/i^2/(a*d-b*c)^3/g*B^2*b*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^3+d^3/e^2/i^2/(a*d-b*c)^3/g*B^2*((b*e/d+(a*d-b*c)*e/d
/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*c)*e/d/(d*x+c)+2*b*e/d))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 921 vs. $2(199) = 398$.
time = 0.36, size = 921, normalized size = 4.30

$$-B^2\left(\frac{b\log(bx+a)}{(b^2c^2-2abcd+a^2d^2)g}-\frac{b\log(dx+c)}{(b^2c^2-2abcd+a^2d^2)g}+\frac{1}{(bcd-ad^2)gx+(bc^2-acd)g}\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)^2-2AB\left(\frac{b\log(bx+a)}{(b^2c^2-2abcd+a^2d^2)g}-\frac{b\log(dx+c)}{(b^2c^2-2abcd+a^2d^2)g}+\frac{1}{(bcd-ad^2)gx+(bc^2-acd)g}\right)\log\left(\frac{bxe}{dx+c}+\frac{ae}{dx+c}\right)+\frac{1}{3}B^2\left(\ldots\right) \text{[illegible]}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] -B^2*(b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) - b*log(d*x + c)/(
(b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) + 1/((b*c*d - a*d^2)*g*x + (b*c^2 - a*c*
d)*g))*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2 - 2*A*B*(b*log(b*x + a)/((b^2
*c^2 - 2*a*b*c*d + a^2*d^2)*g) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2
```

```
*d^2)*g) + 1/((b*c*d - a*d^2)*g*x + (b*c^2 - a*c*d)*g))*log(b*x*e/(d*x + c)
 + a*e/(d*x + c)) + 1/3*B^2*(3*((b*d*x + b*c)*log(b*x + a)^2 + (b*d*x + b*c
)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log(b*x + a) - 2*(b*d*x
+ b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*log(b*x*e/(d*x + c) + a*e
/(d*x + c))/(b^2*c^3*g - 2*a*b*c^2*d*g + a^2*c*d^2*g + (b^2*c^2*d*g - 2*a*b
*c*d^2*g + a^2*d^3*g)*x) - ((b*d*x + b*c)*log(b*x + a)^3 - (b*d*x + b*c)*lo
g(d*x + c)^3 + 3*(b*d*x + b*c)*log(b*x + a)^2 + 3*(b*d*x + b*c + (b*d*x + b
*c)*log(b*x + a))*log(d*x + c)^2 + 6*b*c - 6*a*d + 6*(b*d*x + b*c)*log(b*x
+ a) - 3*(2*b*d*x + (b*d*x + b*c)*log(b*x + a)^2 + 2*b*c + 2*(b*d*x + b*c)*
log(b*x + a))*log(d*x + c))/(b^2*c^3*g - 2*a*b*c^2*d*g + a^2*c*d^2*g + (b^2
*c^2*d*g - 2*a*b*c*d^2*g + a^2*d^3*g)*x)) - A^2*(b*log(b*x + a)/((b^2*c^2 -
 2*a*b*c*d + a^2*d^2)*g) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*
g) + 1/((b*c*d - a*d^2)*g*x + (b*c^2 - a*c*d)*g)) + ((b*d*x + b*c)*log(b*x
+ a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log
(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*A*B/
(b^2*c^3*g - 2*a*b*c^2*d*g + a^2*c*d^2*g + (b^2*c^2*d*g - 2*a*b*c*d^2*g + a
^2*d^3*g)*x)
```

Fricas [A]
time = 0.40, size = 227, normalized size = 1.06

$$-\frac{(B^2bdx+B^2bc)\log\left(\frac{(bx+a)e}{dx+c}\right)^3+3\,(A^2-2\,AB+2\,B^2)bc-3\,(A^2-2\,AB+2\,B^2)ad+3\,(ABbc-B^2ad+(AB-B^2)bdx)\log\left(\frac{(bx+a)e}{dx+c}\right)^2+3\,(A^2bc+(A^2-2\,AB+2\,B^2)bdx-2\,(AB-B^2)ad)\log\left(\frac{(bx+a)e}{dx+c}\right)}{3\,((b^2c^2d-2\,abcd^2+a^2d^3)gx+(b^2c^3-2\,abc^2d+a^2cd^2)g)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] -1/3*((B^2*b*d*x + B^2*b*c)*log((b*x + a)*e/(d*x + c))^3 + 3*(A^2 - 2*A*B +
 2*B^2)*b*c - 3*(A^2 - 2*A*B + 2*B^2)*a*d + 3*(A*B*b*c - B^2*a*d + (A*B - B
^2)*b*d*x)*log((b*x + a)*e/(d*x + c))^2 + 3*(A^2*b*c + (A^2 - 2*A*B + 2*B^2
)*b*d*x - 2*(A*B - B^2)*a*d)*log((b*x + a)*e/(d*x + c)))/((b^2*c^2*d - 2*a*
b*c*d^2 + a^2*d^3)*g*x + (b^2*c^3 - 2*a*b*c^2*d + a^2*c*d^2)*g)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 539 vs. $2(185) = 370$.
time = 0.94, size = 539, normalized size = 2.52

$$\frac{B^2b\log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3a^2d^2gi^2-6abcdgi^2+3b^2c^2gi^2}+\frac{(-2AB+2B^2)\log\left(\frac{e(a+bx)}{c+dx}\right)}{acdgi^2+ad^2gi^2x-bc^2gi^2-bcdgi^2x}+(A^2-2AB+2B^2)\left(-\frac{b\log\left(x+\frac{-\frac{a^3bd^3}{(ad-bc)^2}+\frac{3a^2b^2cd^2}{(ad-bc)^2}-\frac{3ab^3c^2d}{(ad-bc)^2}+abd+\frac{b^4c^3}{(ad-bc)^2}+b^2c}{2b^2d}\right)}{gi^2\,(ad-bc)^2}+\frac{b\log\left(x+\frac{\frac{a^3bd^3}{(ad-bc)^2}-\frac{3a^2b^2cd^2}{(ad-bc)^2}+\frac{3ab^3c^2d}{(ad-bc)^2}+abd-\frac{b^4c^3}{(ad-bc)^2}+b^2c}{2b^2d}\right)}{gi^2\,(ad-bc)^2}-\frac{1}{acdgi^2-bc^2gi^2+x\,(ad^2gi^2-bcdgi^2)}\right)+\frac{(ABbc+ABbdx-B^2ad-B^2bdx)\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{a^2cd^2gi^2+a^2d^3gi^2x-2abc^2dgi^2-2abcd^2gi^2x+b^2c^3gi^2+b^2c^2dgi^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)/(d*i*x+c*i)**2,x)
```

```
[Out] B**2*b*log(e*(a + b*x)/(c + d*x))**3/(3*a**2*d**2*g*i**2 - 6*a*b*c*d*g*i**2
 + 3*b**2*c**2*g*i**2) + (-2*A*B + 2*B**2)*log(e*(a + b*x)/(c + d*x))/(a*c*
d*g*i**2 + a*d**2*g*i**2*x - b*c**2*g*i**2 - b*c*d*g*i**2*x) + (A**2 - 2*A*
```

```
B + 2*B**2)*(-b*log(x + (-a**3*b*d**3/(a*d - b*c)**2 + 3*a**2*b**2*c*d**2/(
a*d - b*c)**2 - 3*a*b**3*c**2*d/(a*d - b*c)**2 + a*b*d + b**4*c**3/(a*d - b
*c)**2 + b**2*c)/(2*b**2*d))/(g*i**2*(a*d - b*c)**2) + b*log(x + (a**3*b*d*
*3/(a*d - b*c)**2 - 3*a**2*b**2*c*d**2/(a*d - b*c)**2 + 3*a*b**3*c**2*d/(a*
d - b*c)**2 + a*b*d - b**4*c**3/(a*d - b*c)**2 + b**2*c)/(2*b**2*d))/(g*i**
2*(a*d - b*c)**2) - 1/(a*c*d*g*i**2 - b*c**2*g*i**2 + x*(a*d**2*g*i**2 - b*
c*d*g*i**2))) + (A*B*b*c + A*B*b*d*x - B**2*a*d - B**2*b*d*x)*log(e*(a + b*
x)/(c + d*x))**2/(a**2*c*d**2*g*i**2 + a**2*d**3*g*i**2*x - 2*a*b*c**2*d*g*
i**2 - 2*a*b*c*d**2*g*i**2*x + b**2*c**3*g*i**2 + b**2*c**2*d*g*i**2*x)
```

Giac [A]
time = 3.71, size = 349, normalized size = 1.63

$$-\frac{\left(B^{2} b e \log \left(\frac{b x e+a e}{d x+c}\right)^{3}+3 \, A B b e \log \left(\frac{b x e+a e}{d x+c}\right)^{2}+3 \, A^{2} b e \log \left(\frac{b x e+a e}{d x+c}\right)-\frac{3 \, (b x e+a e) B^{2} d \log \left(\frac{b x e+a e}{d x+c}\right)^{2}}{d x+c}-\frac{6 \, (b x e+a e) A B d \log \left(\frac{b x e+a e}{d x+c}\right)}{d x+c}+\frac{6 \, (b x e+a e) B^{2} d \log \left(\frac{b x e+a e}{d x+c}\right)}{d x+c}-\frac{3 \, (b x e+a e) A^{2} d}{d x+c}+\frac{6 \, (b x e+a e) A B d}{d x+c}-\frac{6 \, (b x e+a e) B^{2} d}{d x+c}\right)\left(\frac{b c}{(b c e-a d e)(b c-a d)}-\frac{a d}{(b c e-a d e)(b c-a d)}\right)}{3 \, (b c g-a d g)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] -1/3*(B^2*b*e*log((b*x*e + a*e)/(d*x + c))^3 + 3*A*B*b*e*log((b*x*e + a*e)/
(d*x + c))^2 + 3*A^2*b*e*log((b*x*e + a*e)/(d*x + c)) - 3*(b*x*e + a*e)*B^2
*d*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) - 6*(b*x*e + a*e)*A*B*d*log((b*
x*e + a*e)/(d*x + c))/(d*x + c) + 6*(b*x*e + a*e)*B^2*d*log((b*x*e + a*e)/(
d*x + c))/(d*x + c) - 3*(b*x*e + a*e)*A^2*d/(d*x + c) + 6*(b*x*e + a*e)*A*B
*d/(d*x + c) - 6*(b*x*e + a*e)*B^2*d/(d*x + c))*(b*c/((b*c*e - a*d*e)*(b*c
- a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b*c*g - a*d*g)
```

Mupad [B]
time = 6.28, size = 423, normalized size = 1.98

$$\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)^2\,\left(\frac{B\,b\,\left(A-B\right)}{g\,i^2\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{B^2\,\left(a\,d-b\,c\right)}{b\,d\,g\,i^2\,\left(\frac{x}{b}+\frac{c}{b\,d}\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)-\frac{A^2-2\,A\,B+2\,B^2}{\left(a\,d-b\,c\right)\,\left(c\,g\,i^2+d\,g\,i^2\,x\right)}+\frac{B^2\,b\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)^3}{3\,g\,i^2\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{2\,B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(A-B\right)\,\left(a\,d-b\,c\right)}{b\,d\,g\,i^2\,\left(\frac{x}{b}+\frac{c}{b\,d}\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{b\,\mathrm{atan}\left(\frac{b\,\left(2\,b\,d\,x+\frac{a^2\,d^2\,g\,i^2-b^2\,c^2\,g\,i^2}{g\,i^2\,\left(a\,d-b\,c\right)}\right)\,\left(A^2-2\,A\,B+2\,B^2\right)\,1{}\mathrm{i}}{\left(a\,d-b\,c\right)\,\left(b\,A^2-2\,b\,A\,B+2\,b\,B^2\right)}\right)\,\left(A^2-2\,A\,B+2\,B^2\right)\,2{}\mathrm{i}}{g\,i^2\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)*(c*i + d*i*x)^2),
x)
```

```
[Out] log((e*(a + b*x))/(c + d*x))^2*((B*b*(A - B))/(g*i^2*(a^2*d^2 + b^2*c^2 - 2
*a*b*c*d)) - (B^2*(a*d - b*c))/(b*d*g*i^2*(x/b + c/(b*d))*(a^2*d^2 + b^2*c^
2 - 2*a*b*c*d))) - (A^2 + 2*B^2 - 2*A*B)/((a*d - b*c)*(c*g*i^2 + d*g*i^2*x)
) + (B^2*b*log((e*(a + b*x))/(c + d*x))^3)/(3*g*i^2*(a^2*d^2 + b^2*c^2 - 2*
a*b*c*d)) - (b*atan((b*(2*b*d*x + (a^2*d^2*g*i^2 - b^2*c^2*g*i^2)/(g*i^2*(a
*d - b*c)))*(A^2 + 2*B^2 - 2*A*B)*1i)/((a*d - b*c)*(A^2*b + 2*B^2*b - 2*A*B
*b)))*(A^2 + 2*B^2 - 2*A*B)*2i)/(g*i^2*(a*d - b*c)^2) - (2*B*log((e*(a + b*
x))/(c + d*x))*(A - B)*(a*d - b*c))/(b*d*g*i^2*(x/b + c/(b*d))*(a^2*d^2 + b
^2*c^2 - 2*a*b*c*d))
```

3.97 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)^2}\,dx$

Optimal. Leaf size=365

$$-\frac{2ABd^2(a+bx)}{(bc-ad)^3g^2i^2(c+dx)}+\frac{2B^2d^2(a+bx)}{(bc-ad)^3g^2i^2(c+dx)}-\frac{2b^2B^2(c+dx)}{(bc-ad)^3g^2i^2(a+bx)}-\frac{2B^2d^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(bc-ad)^3g^2i^2(c+dx)}-\frac{2b}{}$$

```
[Out] -2*A*B*d^2*(b*x+a)/(-a*d+b*c)^3/g^2/i^2/(d*x+c)+2*B^2*d^2*(b*x+a)/(-a*d+b*c
)^3/g^2/i^2/(d*x+c)-2*b^2*B^2*(d*x+c)/(-a*d+b*c)^3/g^2/i^2/(b*x+a)-2*B^2*d^
2*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/(-a*d+b*c)^3/g^2/i^2/(d*x+c)-2*b^2*B*(d*x+c
)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^2/i^2/(b*x+a)+d^2*(b*x+a)*(A+B
*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3/g^2/i^2/(d*x+c)-b^2*(d*x+c)*(A+B*ln(
e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3/g^2/i^2/(b*x+a)-2/3*b*d*(A+B*ln(e*(b*x+a
)/(d*x+c)))^3/B/(-a*d+b*c)^3/g^2/i^2
```

Rubi [A]

time = 0.24, antiderivative size = 365, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2562, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2i^2(a+bx)(bc-ad)^3}-\frac{2b^2B(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^2(a+bx)(bc-ad)^3}+\frac{d^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2i^2(c+dx)(bc-ad)^3}-\frac{2ABd^2(a+bx)}{g^2i^2(c+dx)(bc-ad)^3}-\frac{2bd\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bg^2i^2(bc-ad)^3}-\frac{2b^2B^2(c+dx)}{g^2i^2(a+bx)(bc-ad)^3}-\frac{2B^2d^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{g^2i^2(c+dx)(bc-ad)^3}+\frac{2B^2d^2(a+bx)}{g^2i^2(c+dx)(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*i*x)^2
),x]
```

```
[Out] (-2*A*B*d^2*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) + (2*B^2*d^2*(a +
b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B^2*(c + d*x))/((b*c - a*d
)^3*g^2*i^2*(a + b*x)) - (2*B^2*d^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])
/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B*(c + d*x)*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) + (d^2*(a + b*x)*(A +
B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (b^2
*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^2*i^2*(
a + b*x)) - (2*b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)
^3*g^2*i^2)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(97c+97dx)^2(ag+bgx)^2}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)^2} - \frac{2b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^3g^2(a+bx)} + \frac{d^2\left(A+\right.}{9409(bc}\right.$$

$$= -\frac{(2b^2d)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{9409(bc-ad)^3g^2} + \frac{(2bd^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{9409(bc-ad)^3g^2} + \frac{b^2\int}{94}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx}{940}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx}{940}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx}{940}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx}{940}$$

$$= -\frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(a+bx)} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\right.}{9409(bc-}$$

$$= -\frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(a+bx)} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\right.}{9409(bc-}$$

$$= \frac{2bB^2d\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9409(bc-ad)^3g^2} - \frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(a+bx)} + \frac{2Bd\left(A\right.}{9409(b}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+}{9409(bc-ad)}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+}{9409(bc-ad)}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+}{9409(bc-ad)}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+}{9409(bc-ad)}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+}{9409(bc-ad)}$$

Mathematica [A]
time = 0.62, size = 307, normalized size = 0.84

$$-\frac{-3(A^2-2AB+2B^2)\,d(-bc+ad)(a+bx)+3b(A^2+2AB+2B^2)\,(bc-ad)(c+dx)+6b(A^2+2B^2)\,d(a+bx)(c+dx)\log(a+bx)+6B(bc-ad)(Abc+bBc+aAd-aBd+2Abdx)\log\left(\frac{e(a+bx)}{c+dx}\right)+3B(-a^2Bd^2+2abd(-Bdx+A(c+dx))+b^2(2Adx(c+dx)+Bc(c+2dx)))\log^2\left(\frac{e(a+bx)}{c+dx}\right)+2bB^2d(a+bx)(c+dx)\log^3\left(\frac{e(a+bx)}{c+dx}\right)-6b(A^2+2B^2)\,d(a+bx)(c+dx)\log(c+dx)}{3(bc-ad)^3g^2i^2(a+bx)(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*
i*x)^2),x]
```

```
[Out] -1/3*(-3*(A^2 - 2*A*B + 2*B^2)*d*(-(b*c) + a*d)*(a + b*x) + 3*b*(A^2 + 2*A*
B + 2*B^2)*(b*c - a*d)*(c + d*x) + 6*b*(A^2 + 2*B^2)*d*(a + b*x)*(c + d*x)*
Log[a + b*x] + 6*B*(b*c - a*d)*(A*b*c + b*B*c + a*A*d - a*B*d + 2*A*b*d*x)*
Log[(e*(a + b*x))/(c + d*x)] + 3*B*(-(a^2*B*d^2) + 2*a*b*d*(-(B*d*x) + A*(c
 + d*x)) + b^2*(2*A*d*x*(c + d*x) + B*c*(c + 2*d*x)))*Log[(e*(a + b*x))/(c
+ d*x)]^2 + 2*b*B^2*d*(a + b*x)*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^3 -
6*b*(A^2 + 2*B^2)*d*(a + b*x)*(c + d*x)*Log[c + d*x])/((b*c - a*d)^3*g^2*i^
2*(a + b*x)*(c + d*x))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 871 vs. 2(363) = 726.
time = 0.63, size = 872, normalized size = 2.39 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-d^2/i^2/(a*d-b*c)^4/g^2*A^2*b^2/(b*e/d+(a*d-b*c)*e/d/(
d*x+c))-2*d^3/e/i^2/(a*d-b*c)^4/g^2*A^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d
^4/e^2/i^2/(a*d-b*c)^4/g^2*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*d^2/i^2/(a*d
-b*c)^4/g^2*A*B*b^2*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))-2*d^3/e/i^2/(a*d-b*c)^4/g^2*A*B
*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+2*d^4/e^2/i^2/(a*d-b*c)^4/g^2*A*B*((b*
e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d
*x+c)-b*e/d)+d^2/i^2/(a*d-b*c)^4/g^2*B^2*b^2*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))-2/3*d^3/e/i^2/(
a*d-b*c)^4/g^2*B^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3+d^4/e^2/i^2/(a*d-b*c
)^4/g^2*B^2*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^
2-2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*
c)*e/d/(d*x+c)+2*b*e/d))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1846 vs. 2(344) = 688.
time = 0.41, size = 1846, normalized size = 5.06

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] B^2*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*x^2
 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*x + (a*b^2*c^3 - 2*a
^2*b*c^2*d + a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d
 + 3*a^2*b*c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c
^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2))*log(b*x*e/(d*x + c) + a*e/(d*x + c))^
2 + 2*A*B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g
^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*x + (a*b^2*c^3
 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2
*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a
*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2))*log(b*x*e/(d*x + c) + a*e/(d*x
+ c)) + 2/3*B^2*(3*(b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*c*d
+ (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b^2*c
*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (b^2*
c*d + a*b*d^2)*x)*log(d*x + c)^2)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(a*b
^3*c^4*g^2 - 3*a^2*b^2*c^3*d*g^2 + 3*a^3*b*c^2*d^2*g^2 - a^4*c*d^3*g^2 + (b
^4*c^3*d*g^2 - 3*a*b^3*c^2*d^2*g^2 + 3*a^2*b^2*c*d^3*g^2 - a^3*b*d^4*g^2)*x
^2 + (b^4*c^4*g^2 - 2*a*b^3*c^3*d*g^2 + 2*a^3*b*c*d^3*g^2 - a^4*d^4*g^2)*x)
 + (3*b^2*c^2 - 3*a^2*d^2 + (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)
*log(b*x + a)^3 + 3*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x
 + a)*log(d*x + c)^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(
d*x + c)^3 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d
+ a*b*d^2)*x)*log(b*x + a) - 3*(2*b^2*d^2*x^2 + 2*a*b*c*d + (b^2*d^2*x^2 +
a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*c*d + a*b*d^2)*x)*
log(d*x + c))/(a*b^3*c^4*g^2 - 3*a^2*b^2*c^3*d*g^2 + 3*a^3*b*c^2*d^2*g^2 -
a^4*c*d^3*g^2 + (b^4*c^3*d*g^2 - 3*a*b^3*c^2*d^2*g^2 + 3*a^2*b^2*c*d^3*g^2
- a^3*b*d^4*g^2)*x^2 + (b^4*c^4*g^2 - 2*a*b^3*c^3*d*g^2 + 2*a^3*b*c*d^3*g^2
 - a^4*d^4*g^2)*x)) + A^2*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^
2 + a^2*b*d^3)*g^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^
2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)/((b
^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x + c)
/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2)) + 2*(b^2*c^2 -
2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b
*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*
log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)
^2)*A*B/(a*b^3*c^4*g^2 - 3*a^2*b^2*c^3*d*g^2 + 3*a^3*b*c^2*d^2*g^2 - a^4*c*
d^3*g^2 + (b^4*c^3*d*g^2 - 3*a*b^3*c^2*d^2*g^2 + 3*a^2*b^2*c*d^3*g^2 - a^3*
b*d^4*g^2)*x^2 + (b^4*c^4*g^2 - 2*a*b^3*c^3*d*g^2 + 2*a^3*b*c*d^3*g^2 - a^4
*d^4*g^2)*x)
```

Fricas [A]

time = 0.38, size = 503, normalized size = 1.38

$$-\frac{12 ABabcd - 3 (A^2 + 2 AB + 2 B^2) b^2 c^2 + 3 (A^2 - 2 AB + 2 B^2) a^2 d^2 - 2 (B^2 b^2 d^2 x^2 + B^2 abcd + (B^2 b^2 cd + B^2 abd^2) x) \log\left(\frac{(bx+a)e}{dx+c}\right)^3 - 3 (2 ABb^2 d^2 x^2 + B^2 b^2 c^2 + 2 ABabcd - B^2 a^2 d^2 + 2 ((AB + B^2) b^2 cd + (AB - B^2) abd^2) x) \log\left(\frac{(bx+a)e}{dx+c}\right)^2 - 6 ((A^2 + 2 B^2) b^2 cd - (A^2 + 2 B^2) abd^2) x - 6 ((A^2 + 2 B^2) b^2 d^2 x^2 + A^2 abcd + (AB + B^2) b^2 c^2 - (AB - B^2) a^2 d^2 + ((A^2 + 2 AB + 2 B^2) b^2 cd + (A^2 - 2 AB + 2 B^2) abd^2) x) \log\left(\frac{(bx+a)e}{dx+c}\right)}{3 ((b^4 c^3 d - 3 ab^3 c^2 d^2 + 3 a^2 b^2 cd^3 - a^3 bd^4) g^2 x^2 + (b^4 c^4 - 2 ab^3 c^3 d + 2 a^3 bcd^3 - a^4 d^4) g^2 x + (ab^3 c^4 - 3 a^2 b^2 c^3 d + 3 a^3 bc^2 d^2 - a^4 cd^3) g^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] -1/3*(12*A*B*a*b*c*d - 3*(A^2 + 2*A*B + 2*B^2)*b^2*c^2 + 3*(A^2 - 2*A*B + 2
*B^2)*a^2*d^2 - 2*(B^2*b^2*d^2*x^2 + B^2*a*b*c*d + (B^2*b^2*c*d + B^2*a*b*d
^2)*x)*log((b*x + a)*e/(d*x + c))^3 - 3*(2*A*B*b^2*d^2*x^2 + B^2*b^2*c^2 +
2*A*B*a*b*c*d - B^2*a^2*d^2 + 2*((A*B + B^2)*b^2*c*d + (A*B - B^2)*a*b*d^2)
*x)*log((b*x + a)*e/(d*x + c))^2 - 6*((A^2 + 2*B^2)*b^2*c*d - (A^2 + 2*B^2)
*a*b*d^2)*x - 6*((A^2 + 2*B^2)*b^2*d^2*x^2 + A^2*a*b*c*d + (A*B + B^2)*b^2*
c^2 - (A*B - B^2)*a^2*d^2 + ((A^2 + 2*A*B + 2*B^2)*b^2*c*d + (A^2 - 2*A*B +
 2*B^2)*a*b*d^2)*x)*log((b*x + a)*e/(d*x + c)))/((b^4*c^3*d - 3*a*b^3*c^2*d
^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^2*x^2 + (b^4*c^4 - 2*a*b^3*c^3*d + 2*a^
3*b*c*d^3 - a^4*d^4)*g^2*x + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2
 - a^4*c*d^3)*g^2)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 1404 vs. $2(335) = 670$.
time = 4.12, size = 1404, normalized size = 3.85

$$\frac{2B^2bd\log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3a^3d^3g^2i^2 - 9a^2bcd^2g^2i^2 + 9ab^2c^2dg^2i^2 - 3b^3c^3g^2i^2} - \frac{2bd(A^2+2B^2)\log\left(x + \frac{2A^2abd^2 + 2A^2b^2cd + 4B^2abd^2 + 4B^2b^2cd - \frac{2a^4bd^5(A^2+2B^2)}{(ad-bc)^3} + \frac{8a^3b^2cd^4(A^2+2B^2)}{(ad-bc)^3} - \frac{12a^2b^3c^2d^3(A^2+2B^2)}{(ad-bc)^3} + \frac{8ab^4c^3d^2(A^2+2B^2)}{(ad-bc)^3} - \frac{2b^5c^4d(A^2+2B^2)}{(ad-bc)^3}}{4A^2b^2d^2 + 8B^2b^2d^2}\right)}{g^2i^2(ad-bc)^3} + \frac{2bd(A^2+2B^2)\log\left(x + \frac{2A^2abd^2 + 2A^2b^2cd + 4B^2abd^2 + 4B^2b^2cd + \frac{2a^4bd^5(A^2+2B^2)}{(ad-bc)^3} - \frac{8a^3b^2cd^4(A^2+2B^2)}{(ad-bc)^3} + \frac{12a^2b^3c^2d^3(A^2+2B^2)}{(ad-bc)^3} - \frac{8ab^4c^3d^2(A^2+2B^2)}{(ad-bc)^3} + \frac{2b^5c^4d(A^2+2B^2)}{(ad-bc)^3}}{4A^2b^2d^2 + 8B^2b^2d^2}\right)}{g^2i^2(ad-bc)^3} + \frac{(-2ABad - 2ABbc - 4ABbdx + 2B^2ad - 2B^2bc)\log\left(\frac{e(a+bx)}{c+dx}\right)}{a^3cd^2g^2i^2 + a^3d^3g^2i^2x - 2a^2bc^2dg^2i^2 - a^2bcd^2g^2i^2x + a^2bd^3g^2i^2x^2 + ab^2c^3g^2i^2 - ab^2c^2dg^2i^2x - 2ab^2cd^2g^2i^2x^2 + b^3c^3g^2i^2x + b^3c^2dg^2i^2x^2} + \frac{(2ABabcd + 2ABabd^2x + 2ABb^2cdx + 2ABb^2d^2x^2 - B^2a^2d^2 - 2B^2abd^2x + B^2b^2c^2 + 2B^2b^2cdx)\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{a^4cd^2g^2i^2 + a^4d^3g^2i^2x - 3a^3bc^2dg^2i^2 - 2a^3bcd^2g^2i^2x + a^3bd^3g^2i^2x^2 + 3a^2b^2c^3g^2i^2 - 3a^2b^2cd^2g^2i^2x^2 - ab^3c^4g^2i^2 + 2ab^3c^3dg^2i^2x + 3ab^3c^2d^2g^2i^2x^2 - b^4c^4g^2i^2x - b^4c^3dg^2i^2x^2} - \frac{A^2ad + A^2bc - 2ABad + 2ABbc + 2B^2ad + 2B^2bc + x(2A^2bd + 4B^2bd)}{a^3cd^2g^2i^2 - 2a^2bc^2dg^2i^2 + ab^2c^3g^2i^2 + x^2(a^2bd^3g^2i^2 - 2ab^2cd^2g^2i^2 + b^3c^2dg^2i^2) + x(a^3d^3g^2i^2 - a^2bcd^2g^2i^2 - ab^2c^2dg^2i^2 + b^3c^3g^2i^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**2,x)
```

```
[Out] 2*B**2*b*d*log(e*(a + b*x)/(c + d*x))**3/(3*a**3*d**3*g**2*i**2 - 9*a**2*b*
c*d**2*g**2*i**2 + 9*a*b**2*c**2*d*g**2*i**2 - 3*b**3*c**3*g**2*i**2) - 2*b
*d*(A**2 + 2*B**2)*log(x + (2*A**2*a*b*d**2 + 2*A**2*b**2*c*d + 4*B**2*a*b*
d**2 + 4*B**2*b**2*c*d - 2*a**4*b*d**5*(A**2 + 2*B**2)/(a*d - b*c)**3 + 8*a
**3*b**2*c*d**4*(A**2 + 2*B**2)/(a*d - b*c)**3 - 12*a**2*b**3*c**2*d**3*(A*
*2 + 2*B**2)/(a*d - b*c)**3 + 8*a*b**4*c**3*d**2*(A**2 + 2*B**2)/(a*d - b*c
)**3 - 2*b**5*c**4*d*(A**2 + 2*B**2)/(a*d - b*c)**3)/(4*A**2*b**2*d**2 + 8*
B**2*b**2*d**2))/(g**2*i**2*(a*d - b*c)**3) + 2*b*d*(A**2 + 2*B**2)*log(x +
 (2*A**2*a*b*d**2 + 2*A**2*b**2*c*d + 4*B**2*a*b*d**2 + 4*B**2*b**2*c*d + 2
*a**4*b*d**5*(A**2 + 2*B**2)/(a*d - b*c)**3 - 8*a**3*b**2*c*d**4*(A**2 + 2*
B**2)/(a*d - b*c)**3 + 12*a**2*b**3*c**2*d**3*(A**2 + 2*B**2)/(a*d - b*c)**
3 - 8*a*b**4*c**3*d**2*(A**2 + 2*B**2)/(a*d - b*c)**3 + 2*b**5*c**4*d*(A**2
 + 2*B**2)/(a*d - b*c)**3)/(4*A**2*b**2*d**2 + 8*B**2*b**2*d**2))/(g**2*i**
2*(a*d - b*c)**3) + (-2*A*B*a*d - 2*A*B*b*c - 4*A*B*b*d*x + 2*B**2*a*d - 2*
B**2*b*c)*log(e*(a + b*x)/(c + d*x))/(a**3*c*d**2*g**2*i**2 + a**3*d**3*g**
2*i**2*x - 2*a**2*b*c**2*d*g**2*i**2 - a**2*b*c*d**2*g**2*i**2*x + a**2*b*d
```

```
**3*g**2*i**2*x**2 + a*b**2*c**3*g**2*i**2 - a*b**2*c**2*d*g**2*i**2*x - 2*
a*b**2*c*d**2*g**2*i**2*x**2 + b**3*c**3*g**2*i**2*x + b**3*c**2*d*g**2*i**
2*x**2) + (2*A*B*a*b*c*d + 2*A*B*a*b*d**2*x + 2*A*B*b**2*c*d*x + 2*A*B*b**2
*d**2*x**2 - B**2*a**2*d**2 - 2*B**2*a*b*d**2*x + B**2*b**2*c**2 + 2*B**2*b
**2*c*d*x)*log(e*(a + b*x)/(c + d*x))**2/(a**4*c*d**3*g**2*i**2 + a**4*d**4
*g**2*i**2*x - 3*a**3*b*c**2*d**2*g**2*i**2 - 2*a**3*b*c*d**3*g**2*i**2*x +
 a**3*b*d**4*g**2*i**2*x**2 + 3*a**2*b**2*c**3*d*g**2*i**2 - 3*a**2*b**2*c*
d**3*g**2*i**2*x**2 - a*b**3*c**4*g**2*i**2 + 2*a*b**3*c**3*d*g**2*i**2*x +
 3*a*b**3*c**2*d**2*g**2*i**2*x**2 - b**4*c**4*g**2*i**2*x - b**4*c**3*d*g*
*2*i**2*x**2) - (A**2*a*d + A**2*b*c - 2*A*B*a*d + 2*A*B*b*c + 2*B**2*a*d +
 2*B**2*b*c + x*(2*A**2*b*d + 4*B**2*b*d))/(a**3*c*d**2*g**2*i**2 - 2*a**2*
b*c**2*d*g**2*i**2 + a*b**2*c**3*g**2*i**2 + x**2*(a**2*b*d**3*g**2*i**2 -
2*a*b**2*c*d**2*g**2*i**2 + b**3*c**2*d*g**2*i**2) + x*(a**3*d**3*g**2*i**2
 - a**2*b*c*d**2*g**2*i**2 - a*b**2*c**2*d*g**2*i**2 + b**3*c**3*g**2*i**2)
)
```

Giac [A]
time = 63.11, size = 177, normalized size = 0.48

$$\frac{\left(B^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)^2+2\,ABe^2\log\left(\frac{bxe+ae}{dx+c}\right)+2\,B^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)+A^2e^2+2\,ABe^2+2\,B^2e^2\right)(dx+c)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)^2}{(bxe+ae)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] (B^2*e^2*log((b*x*e + a*e)/(d*x + c))^2 + 2*A*B*e^2*log((b*x*e + a*e)/(d*x
+ c)) + 2*B^2*e^2*log((b*x*e + a*e)/(d*x + c)) + A^2*e^2 + 2*A*B*e^2 + 2*B^
2*e^2)*(d*x + c)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*
(b*c - a*d)))^2/((b*x*e + a*e)*g^2)
```

Mupad [B]
time = 7.20, size = 731, normalized size = 2.00

$$\frac{2\,B^2\,b\,d\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^3}{3\,g^2\,i^2\,(a\,d-b\,c)^3}-\frac{\frac{A^2\,a\,d+A^2\,b\,c+2\,B^2\,a\,d+2\,B^2\,b\,c-2\,A\,B\,a\,d+2\,A\,B\,b\,c}{a\,d-b\,c}+\frac{2\,x\,(b\,d\,A^2+2\,b\,d\,B^2)}{a\,d-b\,c}}{x\,(a^2\,d^2\,g^2\,i^2-b^2\,c^2\,g^2\,i^2)+x^2\,(a\,b\,d^2\,g^2\,i^2-b^2\,c\,d\,g^2\,i^2)-a\,b\,c^2\,g^2\,i^2+a^2\,c\,d\,g^2\,i^2}-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\left(\frac{2\,(B^2\,b\,c-B^2\,a\,d+A\,B\,a\,d+A\,B\,b\,c)}{g^2\,i^2\,(a^2\,b\,d^3-2\,a\,b^2\,c\,d^2+b^3\,c^2\,d)}+\frac{4\,A\,B\,x}{g^2\,i^2\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}\right)}{x^2+\frac{x\,(a\,d+b\,c)}{b\,d}+\frac{a\,c}{b\,d}}-\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2\left(\frac{\frac{B^2\,(a\,d+b\,c)}{g^2\,i^2\,(a^2\,b\,d^3-2\,a\,b^2\,c\,d^2+b^3\,c^2\,d)}+\frac{2\,B^2\,x}{g^2\,i^2\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}}{x^2+\frac{x\,(a\,d+b\,c)}{b\,d}+\frac{a\,c}{b\,d}}-\frac{2\,A\,B\,b\,d}{g^2\,i^2\,(a\,d-b\,c)^3}\right)-\frac{b\,d\,\mathrm{atan}\left(\frac{b\,d\,(A^2+2\,B^2)\left(\frac{a^3\,d^3\,g^2\,i^2-a^2\,b\,c\,d^2\,g^2\,i^2-a\,b^2\,c^2\,d\,g^2\,i^2+b^3\,c^3\,g^2\,i^2}{a^2\,d^2\,g^2\,i^2-2\,a\,b\,c\,d\,g^2\,i^2+b^2\,c^2\,g^2\,i^2}+2\,b\,d\,x\right)(a^2\,d^2\,g^2\,i^2-2\,a\,b\,c\,d\,g^2\,i^2+b^2\,c^2\,g^2\,i^2)\,2\mathrm{i}}{g^2\,i^2\,(a\,d-b\,c)^3\,(2\,b\,d\,A^2+4\,b\,d\,B^2)}\right)(A^2+2\,B^2)\,4\mathrm{i}}{g^2\,i^2\,(a\,d-b\,c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)^2*(c*i + d*i*x)^2
),x)
```

```
[Out] (2*B^2*b*d*log((e*(a + b*x))/(c + d*x))^3)/(3*g^2*i^2*(a*d - b*c)^3) - ((A^
2*a*d + A^2*b*c + 2*B^2*a*d + 2*B^2*b*c - 2*A*B*a*d + 2*A*B*b*c)/(a*d - b*c
) + (2*x*(A^2*b*d + 2*B^2*b*d))/(a*d - b*c))/(x*(a^2*d^2*g^2*i^2 - b^2*c^2*
g^2*i^2) + x^2*(a*b*d^2*g^2*i^2 - b^2*c*d*g^2*i^2) - a*b*c^2*g^2*i^2 + a^2*
c*d*g^2*i^2) - (log((e*(a + b*x))/(c + d*x))*((2*(B^2*b*c - B^2*a*d + A*B*a
*d + A*B*b*c))/(g^2*i^2*(a^2*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) + (4*A*B*x
```

```
)/(g^2*i^2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))))/(x^2 + (x*(a*d + b*c))/(b*d)
+ (a*c)/(b*d)) - (b*d*atan((b*d*(A^2 + 2*B^2)*((a^3*d^3*g^2*i^2 + b^3*c^3*g
^2*i^2 - a*b^2*c^2*d*g^2*i^2 - a^2*b*c*d^2*g^2*i^2)/(a^2*d^2*g^2*i^2 + b^2*
c^2*g^2*i^2 - 2*a*b*c*d*g^2*i^2) + 2*b*d*x)*(a^2*d^2*g^2*i^2 + b^2*c^2*g^2*
i^2 - 2*a*b*c*d*g^2*i^2)*2i)/(g^2*i^2*(a*d - b*c)^3*(2*A^2*b*d + 4*B^2*b*d)
))*(A^2 + 2*B^2)*4i)/(g^2*i^2*(a*d - b*c)^3) - log((e*(a + b*x))/(c + d*x))
^2*(((B^2*(a*d + b*c))/(g^2*i^2*(a^2*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) +
(2*B^2*x)/(g^2*i^2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)))/(x^2 + (x*(a*d + b*c))
/(b*d) + (a*c)/(b*d)) - (2*A*B*b*d)/(g^2*i^2*(a*d - b*c)^3))
```

3.98 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)^2}\,dx$

Optimal. Leaf size=523

$$\frac{2ABd^3(a+bx)}{(bc-ad)^4g^3i^2(c+dx)}-\frac{2B^2d^3(a+bx)}{(bc-ad)^4g^3i^2(c+dx)}+\frac{6b^2B^2d(c+dx)}{(bc-ad)^4g^3i^2(a+bx)}-\frac{b^3B^2(c+dx)^2}{4(bc-ad)^4g^3i^2(a+bx)^2}+\frac{2B^2d^3(}{(bc-}$$

```
[Out] 2*A*B*d^3*(b*x+a)/(-a*d+b*c)^4/g^3/i^2/(d*x+c)-2*B^2*d^3*(b*x+a)/(-a*d+b*c)
^4/g^3/i^2/(d*x+c)+6*b^2*B^2*d*(d*x+c)/(-a*d+b*c)^4/g^3/i^2/(b*x+a)-1/4*b^3
*B^2*(d*x+c)^2/(-a*d+b*c)^4/g^3/i^2/(b*x+a)^2+2*B^2*d^3*(b*x+a)*ln(e*(b*x+a
)/(d*x+c))/(-a*d+b*c)^4/g^3/i^2/(d*x+c)+6*b^2*B*d*(d*x+c)*(A+B*ln(e*(b*x+a)
/(d*x+c)))/(-a*d+b*c)^4/g^3/i^2/(b*x+a)-1/2*b^3*B*(d*x+c)^2*(A+B*ln(e*(b*x+
a)/(d*x+c)))/(-a*d+b*c)^4/g^3/i^2/(b*x+a)^2-d^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(
d*x+c)))^2/(-a*d+b*c)^4/g^3/i^2/(d*x+c)+3*b^2*d*(d*x+c)*(A+B*ln(e*(b*x+a)/(
d*x+c)))^2/(-a*d+b*c)^4/g^3/i^2/(b*x+a)-1/2*b^3*(d*x+c)^2*(A+B*ln(e*(b*x+a)
/(d*x+c)))^2/(-a*d+b*c)^4/g^3/i^2/(b*x+a)^2+b*d^2*(A+B*ln(e*(b*x+a)/(d*x+c)
))^3/B/(-a*d+b*c)^4/g^3/i^2
```

Rubi [A]

time = 0.31, antiderivative size = 523, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2562, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^3(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3i^2(a+bx)^2(bc-ad)^4}-\frac{b^3B(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2d(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^3i^2(a+bx)(bc-ad)^4}+\frac{6b^2Bd(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^2(a+bx)(bc-ad)^4}-\frac{d^3(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^3i^2(c+dx)(bc-ad)^4}+\frac{2ABd^3(a+bx)}{g^3i^2(c+dx)(bc-ad)^4}+\frac{bd^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{Bg^3i^2(bc-ad)^4}-\frac{b^3B^2(c+dx)^2}{4g^3i^2(a+bx)^2(bc-ad)^4}+\frac{6b^2B^2d(c+dx)}{g^3i^2(a+bx)(bc-ad)^4}+\frac{2B^2d^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{g^3i^2(c+dx)(bc-ad)^4}-\frac{2B^2d^3(a+bx)}{g^3i^2(c+dx)(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*i*x)^2
),x]
```

```
[Out] (2*A*B*d^3*(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) - (2*B^2*d^3*(a + b
*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (6*b^2*B^2*d*(c + d*x))/((b*c - a*
d)^4*g^3*i^2*(a + b*x)) - (b^3*B^2*(c + d*x)^2)/(4*(b*c - a*d)^4*g^3*i^2*(a
 + b*x)^2) + (2*B^2*d^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d
)^4*g^3*i^2*(c + d*x)) + (6*b^2*B*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c +
 d*x)]))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B*(c + d*x)^2*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2) - (d^3*(a
+ b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^4*g^3*i^2*(c +
d*x)) + (3*b^2*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c -
a*d)^4*g^3*i^2*(a + b*x)) - (b^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c +
d*x)])^2)/(2*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2) + (b*d^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^3)/(B*(b*c - a*d)^4*g^3*i^2)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
```

```
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(98c+98dx)^2(ag+bgx)^3}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc-ad)^2g^3(a+bx)^3} - \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d^2\left(\right.}{9604(}\right.$$

$$= \frac{(3b^2d^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{9604(bc-ad)^4g^3} - \frac{(3bd^3)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{9604(bc-ad)^4g^3} - \frac{(b^2d)}{}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\right.}{9604(bc-}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\right.}{9604(bc-}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\right.}{9604(bc-}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\right.}{9604(bc-}$$

$$= -\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{5bBd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9604(bc-ad)^3g^3(a+bx)} - \frac{Bd^2\left(A\right.}{4802(b}$$

$$= -\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{5bBd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9604(bc-ad)^3g^3(a+bx)} - \frac{Bd^2\left(A\right.}{4802(b}$$

$$= -\frac{3bB^2d^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9604(bc-ad)^4g^3} - \frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{5b}{9}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{}{4802(bc-}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{}{4802(bc-}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{}{4802(bc-}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{}{4802(bc-}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{}{4802(bc-}$$

Mathematica [A]
time = 0.85, size = 466, normalized size = 0.89

$$\frac{4(A^2-2AB+2B^2)\,d^2(bc-ad)(a+bx)^2-b(2A^2+2AB+B^2)\,(bc-ad)^2(c+dx)+2b(4A^2+10AB+11B^2)\,d(bc-ad)(a+bx)(c+dx)+6b(2A^2+2AB+5B^2)\,d^2(a+bx)^2(c+dx)\log(a+bx)+2B(bc-ad)\left(4(A-B)d^2(a+bx)^2-b(2A+B)(bc-ad)(c+dx)+2b(4A+5B)d(a+bx)(c+dx)\right)\log\left(\frac{e(a+bx)}{c+dx}\right)-2B(2a^3Bd^3-6a^2bd^2(-Bdx+A(c+dx))-6ab^2d(2Adx(c+dx)+Bc(c+2dx))+b^3(-6Ad^2x^2(c+dx)+B(c^3-3c^2dx-9cd^2x^2-3d^3x^3)))\log^2\left(\frac{e(a+bx)}{c+dx}\right)+4bB^2d^2(a+bx)^2(c+dx)\log^3\left(\frac{e(a+bx)}{c+dx}\right)-6b(2A^2+2AB+5B^2)\,d^2(a+bx)^2(c+dx)\log(c+dx)}{4(bc-ad)^4g^3i^2(a+bx)^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*
i*x)^2),x]
```

```
[Out] (4*(A^2 - 2*A*B + 2*B^2)*d^2*(b*c - a*d)*(a + b*x)^2 - b*(2*A^2 + 2*A*B + B
^2)*(b*c - a*d)^2*(c + d*x) + 2*b*(4*A^2 + 10*A*B + 11*B^2)*d*(b*c - a*d)*(
a + b*x)*(c + d*x) + 6*b*(2*A^2 + 2*A*B + 5*B^2)*d^2*(a + b*x)^2*(c + d*x)*
Log[a + b*x] + 2*B*(b*c - a*d)*(4*(A - B)*d^2*(a + b*x)^2 - b*(2*A + B)*(b*
c - a*d)*(c + d*x) + 2*b*(4*A + 5*B)*d*(a + b*x)*(c + d*x))*Log[(e*(a + b*x
))/(c + d*x)] - 2*B*(2*a^3*B*d^3 - 6*a^2*b*d^2*(-(B*d*x) + A*(c + d*x)) - 6
*a*b^2*d*(2*A*d*x*(c + d*x) + B*c*(c + 2*d*x)) + b^3*(-6*A*d^2*x^2*(c + d*x
) + B*(c^3 - 3*c^2*d*x - 9*c*d^2*x^2 - 3*d^3*x^3)))*Log[(e*(a + b*x))/(c +
d*x)]^2 + 4*b*B^2*d^2*(a + b*x)^2*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^3
- 6*b*(2*A^2 + 2*A*B + 5*B^2)*d^2*(a + b*x)^2*(c + d*x)*Log[c + d*x])/(4*(b
*c - a*d)^4*g^3*i^2*(a + b*x)^2*(c + d*x))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1227 vs. 2(517) = 1034.
time = 0.75, size = 1228, normalized size = 2.35

method	result	size
derivativedivides	Expression too large to display	1228
default	Expression too large to display	1228
risch	Expression too large to display	1736
norman	Expression too large to display	1849

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/2*d^2*e/i^2/(a*d-b*c)^5/g^3*A^2*b^3/(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^2-3*d^3/i^2/(a*d-b*c)^5/g^3*A^2*b^2/(b*e/d+(a*d-b*c)*e/d/(d*x+
c))-3*d^4/e/i^2/(a*d-b*c)^5/g^3*A^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d^5/e
^2/i^2/(a*d-b*c)^5/g^3*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2*d^2*e/i^2/(a*d-b
*c)^5/g^3*A*B*b^3*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)+6*d^3/i^2/(a*d-b*c)^5/g^3
*A*B*b^2*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
1/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))-3*d^4/e/i^2/(a*d-b*c)^5/g^3*A*B*b*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))^2+2*d^5/e^2/i^2/(a*d-b*c)^5/g^3*A*B*((b*e/d+(a*d-b*
```

```
c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d
)-d^2*e/i^2/(a*d-b*c)^5/g^3*B^2*b^3*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)+3*d^3/i^2/(a
*d-b*c)^5/g^3*B^2*b^2*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^2-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))-d^4/e/i^2/(a*d-b*c)^5/g^3*B^2*b*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))^3+d^5/e^2/i^2/(a*d-b*c)^5/g^3*B^2*((b*e/d+(a*d-b*
c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*c)*e/d/(d*x+c)+2*b*e/d))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 3942 vs. $2(491) = 982$.
time = 0.67, size = 3942, normalized size = 7.54

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] -1/2*B^2*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3
*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)
*g^3*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2
*a^4*b*d^4)*g^3*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 +
a^4*b*c*d^3 - a^5*d^4)*g^3*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2
*d^2 - a^5*c*d^3)*g^3) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6
*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3) - 6*b*d^2*log(d*x + c)/((b
^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3))
*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2 - A*B*((6*b^2*d^2*x^2 - b^2*c^2 + 5
*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2
*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*
a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*x^2 + (2*a*b^4*c^4 - 5
*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*x + (a^2*b^
3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3) + 6*b*d^2*log(b
*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4
*d^4)*g^3) - 6*b*d^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2
*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3))*log(b*x*e/(d*x + c) + a*e/(d*x + c))
+ 1/4*B^2*(2*(b^3*c^3 - 12*a*b^2*c^2*d + 15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^
3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*
b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x
^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d
^3)*x)*log(d*x + c)^2 - 3*(3*b^3*c^2*d - 2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*(
b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2
+ a^2*b*d^3)*x)*log(b*x + a) + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 +
```

```
2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c
*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b
*x + a))*log(d*x + c))*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(a^2*b^4*c^5*g^
3 - 4*a^3*b^3*c^4*d*g^3 + 6*a^4*b^2*c^3*d^2*g^3 - 4*a^5*b*c^2*d^3*g^3 + a^6
*c*d^4*g^3 + (b^6*c^4*d*g^3 - 4*a*b^5*c^3*d^2*g^3 + 6*a^2*b^4*c^2*d^3*g^3 -
 4*a^3*b^3*c*d^4*g^3 + a^4*b^2*d^5*g^3)*x^3 + (b^6*c^5*g^3 - 2*a*b^5*c^4*d*
g^3 - 2*a^2*b^4*c^3*d^2*g^3 + 8*a^3*b^3*c^2*d^3*g^3 - 7*a^4*b^2*c*d^4*g^3 +
 2*a^5*b*d^5*g^3)*x^2 + (2*a*b^5*c^5*g^3 - 7*a^2*b^4*c^4*d*g^3 + 8*a^3*b^3*
c^3*d^2*g^3 - 2*a^4*b^2*c^2*d^3*g^3 - 2*a^5*b*c*d^4*g^3 + a^6*d^5*g^3)*x) +
 (b^3*c^3 - 24*a*b^2*c^2*d + 15*a^2*b*c*d^2 + 8*a^3*d^3 - 4*(b^3*d^3*x^3 +
a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x
)*log(b*x + a)^3 + 4*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)
*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^3 - 30*(b^3*c*d^2 - a*b^
2*d^3)*x^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 +
 (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d
^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3
*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a
^2*b*d^3)*x)*log(b*x + a))*log(d*x + c)^2 - 3*(7*b^3*c^2*d + 6*a*b^2*c*d^2
- 13*a^2*b*d^3)*x - 30*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^
3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(5*b^3*d^3*x^3 + 5
*a^2*b*c*d^2 + 5*(b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + 2*(b^3*d^3*x^3 + a^2*b*c*d
^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x
 + a)^2 + 5*(2*a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 +
(b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)
)*log(d*x + c))/(a^2*b^4*c^5*g^3 - 4*a^3*b^3*c^4*d*g^3 + 6*a^4*b^2*c^3*d^2*
g^3 - 4*a^5*b*c^2*d^3*g^3 + a^6*c*d^4*g^3 + (b^6*c^4*d*g^3 - 4*a*b^5*c^3*d^
2*g^3 + 6*a^2*b^4*c^2*d^3*g^3 - 4*a^3*b^3*c*d^4*g^3 + a^4*b^2*d^5*g^3)*x^3
+ (b^6*c^5*g^3 - 2*a*b^5*c^4*d*g^3 - 2*a^2*b^4*c^3*d^2*g^3 + 8*a^3*b^3*c^2*
d^3*g^3 - 7*a^4*b^2*c*d^4*g^3 + 2*a^5*b*d^5*g^3)*x^2 + (2*a*b^5*c^5*g^3 - 7
*a^2*b^4*c^4*d*g^3 + 8*a^3*b^3*c^3*d^2*g^3 - 2*a^4*b^2*c^2*d^3*g^3 - 2*a^5*
b*c*d^4*g^3 + a^6*d^5*g^3)*x)) - 1/2*A^2*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*
c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2
+ 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b
^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*x^2 + (2*a*b^4*c^4 - 5*a^2*
b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*x + (a^2*b^3*c^4
 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3) + 6*b*d^2*log(b*x +
a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)
*g^3) - 6*b*d^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2
- 4*a^3*b*c*d^3 + a^4*d^4)*g^3)) + 1/2*(b^3*c^3 - 12*a*b^2*c^2*d + 15*a^2*b
*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3 + a^2*b
*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log
(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2
+ (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2...
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 990 vs.

$2(491) = 982.$
time = 0.42, size = 990, normalized size = 1.89

$$\frac{(2A^2+2AB+B^2)b^3c^3-12(A^2+2AB+2B^2)ab^2c^2d+3(2A^2+10AB+5B^2)a^2bcd^2+4(A^2-2AB+2B^2)a^3d^3-4(B^2b^3d^3x^3+B^2a^2bcd^2+(B^2b^3cd^2+2B^2ab^2d^3)x^2+(2B^2ab^2cd^2+B^2a^2bd^3)x)\log\left(\frac{bxe+ae}{dx+c}\right)^3-6((2A^2+2AB+5B^2)b^3cd^2-(2A^2+2AB+5B^2)ab^2d^3)x^2-2(3(2AB+B^2)b^3d^3x^3-B^2b^3c^3+6B^2ab^2c^2d+6ABa^2bcd^2-2B^2a^3d^3+3(4ABab^2d^3+(2AB+3B^2)b^3cd^2)x^2+3(B^2b^3c^2d+4(AB+B^2)ab^2cd^2+2(AB-B^2)a^2bd^3)x)\log\left(\frac{bxe+ae}{dx+c}\right)^2-3((2A^2+6AB+7B^2)b^3c^2d+2(2A^2-2AB+3B^2)ab^2cd^2-(6A^2+2AB+13B^2)a^2bd^3)x-2(3(2A^2+2AB+5B^2)b^3d^3x^3+6A^2a^2bcd^2-(2AB+B^2)b^3c^3+12(AB+B^2)ab^2c^2d-4(AB-B^2)a^3d^3+3((2A^2+6AB+7B^2)b^3cd^2+4(A^2+2B^2)ab^2d^3)x^2+3((2AB+3B^2)b^3c^2d+4(A^2+2AB+2B^2)ab^2cd^2+2(A^2-2AB+2B^2)a^2bd^3)x)\log\left(\frac{bxe+ae}{dx+c}\right)}{4((b^6c^4d-4ab^5c^3d^2+6a^2b^4c^2d^3-4a^3b^3cd^4+a^4b^2d^5)g^3x^3+(b^6c^5-2ab^5c^4d-2a^2b^4c^3d^2+8a^3b^3c^2d^3-7a^4b^2cd^4+2a^5bd^5)g^3x^2+(2ab^5c^5-7a^2b^4c^4d+8a^3b^3c^3d^2-2a^4b^2c^2d^3-2a^5bcd^4+a^6d^5)g^3x+(a^2b^4c^5-4a^3b^3c^4d+6a^4b^2c^3d^2-4a^5bc^2d^3+a^6cd^4)g^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] 1/4*((2*A^2 + 2*A*B + B^2)*b^3*c^3 - 12*(A^2 + 2*A*B + 2*B^2)*a*b^2*c^2*d +
 3*(2*A^2 + 10*A*B + 5*B^2)*a^2*b*c*d^2 + 4*(A^2 - 2*A*B + 2*B^2)*a^3*d^3 -
 4*(B^2*b^3*d^3*x^3 + B^2*a^2*b*c*d^2 + (B^2*b^3*c*d^2 + 2*B^2*a*b^2*d^3)*x
^2 + (2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*x)*log((b*x + a)*e/(d*x + c))^3 -
6*((2*A^2 + 2*A*B + 5*B^2)*b^3*c*d^2 - (2*A^2 + 2*A*B + 5*B^2)*a*b^2*d^3)*x
^2 - 2*(3*(2*A*B + B^2)*b^3*d^3*x^3 - B^2*b^3*c^3 + 6*B^2*a*b^2*c^2*d + 6*A
*B*a^2*b*c*d^2 - 2*B^2*a^3*d^3 + 3*(4*A*B*a*b^2*d^3 + (2*A*B + 3*B^2)*b^3*c
*d^2)*x^2 + 3*(B^2*b^3*c^2*d + 4*(A*B + B^2)*a*b^2*c*d^2 + 2*(A*B - B^2)*a^
2*b*d^3)*x)*log((b*x + a)*e/(d*x + c))^2 - 3*((2*A^2 + 6*A*B + 7*B^2)*b^3*c
^2*d + 2*(2*A^2 - 2*A*B + 3*B^2)*a*b^2*c*d^2 - (6*A^2 + 2*A*B + 13*B^2)*a^2
*b*d^3)*x - 2*(3*(2*A^2 + 2*A*B + 5*B^2)*b^3*d^3*x^3 + 6*A^2*a^2*b*c*d^2 -
(2*A*B + B^2)*b^3*c^3 + 12*(A*B + B^2)*a*b^2*c^2*d - 4*(A*B - B^2)*a^3*d^3
+ 3*((2*A^2 + 6*A*B + 7*B^2)*b^3*c*d^2 + 4*(A^2 + 2*B^2)*a*b^2*d^3)*x^2 + 3
*((2*A*B + 3*B^2)*b^3*c^2*d + 4*(A^2 + 2*A*B + 2*B^2)*a*b^2*c*d^2 + 2*(A^2
- 2*A*B + 2*B^2)*a^2*b*d^3)*x)*log((b*x + a)*e/(d*x + c)))/((b^6*c^4*d - 4*
a*b^5*c^3*d^2 + 6*a^2*b^4*c^2*d^3 - 4*a^3*b^3*c*d^4 + a^4*b^2*d^5)*g^3*x^3
+ (b^6*c^5 - 2*a*b^5*c^4*d - 2*a^2*b^4*c^3*d^2 + 8*a^3*b^3*c^2*d^3 - 7*a^4*
b^2*c*d^4 + 2*a^5*b*d^5)*g^3*x^2 + (2*a*b^5*c^5 - 7*a^2*b^4*c^4*d + 8*a^3*b
^3*c^3*d^2 - 2*a^4*b^2*c^2*d^3 - 2*a^5*b*c*d^4 + a^6*d^5)*g^3*x + (a^2*b^4*
c^5 - 4*a^3*b^3*c^4*d + 6*a^4*b^2*c^3*d^2 - 4*a^5*b*c^2*d^3 + a^6*c*d^4)*g^
3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 78.58, size = 426, normalized size = 0.81

$$\frac{\left(2\,B^2be^3\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{4\,(bxe+ae)B^2de^2\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+4\,ABbe^3\log\left(\frac{bxe+ae}{dx+c}\right)+2\,B^2be^3\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{8\,(bxe+ae)ABde^2\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{8\,(bxe+ae)B^2de^2\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+2\,A^2be^3+2\,ABbe^3+B^2be^3-\frac{4\,(bxe+ae)A^2de^2}{dx+c}-\frac{8\,(bxe+ae)ABde^2}{dx+c}-\frac{8\,(bxe+ae)B^2de^2}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)^2}{4\left(\frac{(bxe+ae)^2bcg^3}{(dx+c)^2}-\frac{(bxe+ae)^2adg^3}{(dx+c)^2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] 1/4*(2*B^2*b*e^3*log((b*x*e + a*e)/(d*x + c))^2 - 4*(b*x*e + a*e)*B^2*d*e^2
*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 4*A*B*b*e^3*log((b*x*e + a*e)/(
d*x + c)) + 2*B^2*b*e^3*log((b*x*e + a*e)/(d*x + c)) - 8*(b*x*e + a*e)*A*B*
d*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 8*(b*x*e + a*e)*B^2*d*e^2*lo
g((b*x*e + a*e)/(d*x + c))/(d*x + c) + 2*A^2*b*e^3 + 2*A*B*b*e^3 + B^2*b*e^
3 - 4*(b*x*e + a*e)*A^2*d*e^2/(d*x + c) - 8*(b*x*e + a*e)*A*B*d*e^2/(d*x +
c) - 8*(b*x*e + a*e)*B^2*d*e^2/(d*x + c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d)
) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))^2/((b*x*e + a*e)^2*b*c*g^3/(d*x + c)
^2 - (b*x*e + a*e)^2*a*d*g^3/(d*x + c)^2)
```

Mupad [B]
time = 11.47, size = 1497, normalized size = 2.86

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)^3*(c*i + d*i*x)^2
),x)
```

```
[Out] (B^2*b*d^2*log((e*(a + b*x))/(c + d*x))^3)/(g^3*i^2*(a*d - b*c)^2*(a^2*d^2
+ b^2*c^2 - 2*a*b*c*d)) - ((4*A^2*a^2*d^2 - 2*A^2*b^2*c^2 + 8*B^2*a^2*d^2 -
 B^2*b^2*c^2 - 8*A*B*a^2*d^2 - 2*A*B*b^2*c^2 + 10*A^2*a*b*c*d + 23*B^2*a*b*
c*d + 22*A*B*a*b*c*d)/(2*(a*d - b*c)) + (3*x^2*(2*A^2*b^2*d^2 + 5*B^2*b^2*d
^2 + 2*A*B*b^2*d^2))/(a*d - b*c) + (3*x*(6*A^2*a*b*d^2 + 13*B^2*a*b*d^2 + 2
*A^2*b^2*c*d + 7*B^2*b^2*c*d + 2*A*B*a*b*d^2 + 6*A*B*b^2*c*d))/(2*(a*d - b*
c)))/(x*(2*a^4*d^3*g^3*i^2 + 4*a*b^3*c^3*g^3*i^2 - 6*a^2*b^2*c^2*d*g^3*i^2)
 + x^2*(2*b^4*c^3*g^3*i^2 + 4*a^3*b*d^3*g^3*i^2 - 6*a^2*b^2*c*d^2*g^3*i^2)
+ x^3*(2*a^2*b^2*d^3*g^3*i^2 + 2*b^4*c^2*d*g^3*i^2 - 4*a*b^3*c*d^2*g^3*i^2)
 + 2*a^2*b^2*c^3*g^3*i^2 + 2*a^4*c*d^2*g^3*i^2 - 4*a^3*b*c^2*d*g^3*i^2) - (
log((e*(a + b*x))/(c + d*x))*((B^2*b*c - 4*B^2*a*d + 4*A*B*a*d + 2*A*B*b*c)
/(2*g^3*i^2*(a^2*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) - x*((3*(B^2 - 2*A*B))
/(2*g^3*i^2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (3*B*(2*A + B)*(a*d + b*c))/
(g^3*i^2*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) + (3*B*a*c*(2*A + B)
)/(g^3*i^2*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (3*B*b*d*x^2*(2*A
 + B))/(g^3*i^2*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))))/(b*x^3 + (a^
2*c)/(b*d) + (x^2*(b^2*c + 2*a*b*d))/(b*d) + (x*(a^2*d + 2*a*b*c))/(b*d)) -
 (b*d^2*atan((b*d^2*(2*A^2 + 5*B^2 + 2*A*B)*(2*a^4*d^4*g^3*i^2 - 2*b^4*c^4*
g^3*i^2 + 4*a*b^3*c^3*d*g^3*i^2 - 4*a^3*b*c*d^3*g^3*i^2)*3i)/(2*g^3*i^2*(a*
d - b*c)^4*(6*A^2*b*d^2 + 15*B^2*b*d^2 + 6*A*B*b*d^2)) + (b^2*d^3*x*(2*A^2
+ 5*B^2 + 2*A*B)*(a^3*d^3*g^3*i^2 - b^3*c^3*g^3*i^2 + 3*a*b^2*c^2*d*g^3*i^2
 - 3*a^2*b*c*d^2*g^3*i^2)*6i)/(g^3*i^2*(a*d - b*c)^4*(6*A^2*b*d^2 + 15*B^2*
```

```
b*d^2 + 6*A*B*b*d^2)))*(2*A^2 + 5*B^2 + 2*A*B)*3i)/(g^3*i^2*(a*d - b*c)^4)
- log((e*(a + b*x))/(c + d*x))^2*((x*((3*B^2)/(2*g^3*i^2*(a^2*d^2 + b^2*c^2
 - 2*a*b*c*d)) + (3*B^2*(a*d + b*c))/(g^3*i^2*(a*d - b*c)*(a^2*d^2 + b^2*c^
2 - 2*a*b*c*d))) + (B^2*(2*a*d + b*c))/(2*g^3*i^2*(a^2*b*d^3 + b^3*c^2*d -
2*a*b^2*c*d^2)) + (3*B^2*a*c)/(g^3*i^2*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a
*b*c*d)) + (3*B^2*b*d*x^2)/(g^3*i^2*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*
c*d)))/(b*x^3 + (a^2*c)/(b*d) + (x^2*(b^2*c + 2*a*b*d))/(b*d) + (x*(a^2*d +
 2*a*b*c))/(b*d)) - (3*B*b*d^2*(2*A + B))/(2*g^3*i^2*(a*d - b*c)^2*(a^2*d^2
 + b^2*c^2 - 2*a*b*c*d)))
```

3.99 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)^2}\,dx$

Optimal. Leaf size=682

$$-\frac{2ABd^4(a+bx)}{(bc-ad)^5g^4i^2(c+dx)}+\frac{2B^2d^4(a+bx)}{(bc-ad)^5g^4i^2(c+dx)}-\frac{12b^2B^2d^2(c+dx)}{(bc-ad)^5g^4i^2(a+bx)}+\frac{b^3B^2d(c+dx)^2}{(bc-ad)^5g^4i^2(a+bx)^2}-\frac{2\ldots}{27(bc-\ldots}$$

```
[Out] -2*A*B*d^4*(b*x+a)/(-a*d+b*c)^5/g^4/i^2/(d*x+c)+2*B^2*d^4*(b*x+a)/(-a*d+b*c
)^5/g^4/i^2/(d*x+c)-12*b^2*B^2*d^2*(d*x+c)/(-a*d+b*c)^5/g^4/i^2/(b*x+a)+b^3
*B^2*d*(d*x+c)^2/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^2-2/27*b^4*B^2*(d*x+c)^3/(-a*
d+b*c)^5/g^4/i^2/(b*x+a)^3-2*B^2*d^4*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/(-a*d+b*
c)^5/g^4/i^2/(d*x+c)-12*b^2*B*d^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d
+b*c)^5/g^4/i^2/(b*x+a)+2*b^3*B*d*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a
*d+b*c)^5/g^4/i^2/(b*x+a)^2-2/9*b^4*B*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))
/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^3+d^4*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(
-a*d+b*c)^5/g^4/i^2/(d*x+c)-6*b^2*d^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2
/(-a*d+b*c)^5/g^4/i^2/(b*x+a)+2*b^3*d*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))
^2/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^2-1/3*b^4*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+
c)))^2/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^3-4/3*b*d^3*(A+B*ln(e*(b*x+a)/(d*x+c)))
^3/B/(-a*d+b*c)^5/g^4/i^2
```

Rubi [A]
time = 0.36, antiderivative size = 682, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2562, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^4(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4i^2(a+bx)^3(bc-ad)^5}-\frac{2b^4B(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^4i^2(a+bx)^3(bc-ad)^5}+\frac{2b^3d(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^4i^2(a+bx)^2(bc-ad)^5}+\frac{2b^3Bd(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)^2(bc-ad)^5}-\frac{6b^2d^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^4i^2(a+bx)(bc-ad)^5}-\frac{12b^2Bd^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5}+\frac{d^4(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^4i^2(c+dx)(bc-ad)^5}-\frac{2ABd^4(a+bx)}{g^4i^2(c+dx)(bc-ad)^5}-\frac{4bd^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bg^4i^2(bc-ad)^5}-\frac{2b^4B^2(c+dx)^3}{27g^4i^2(a+bx)^3(bc-ad)^5}+\frac{b^3B^2d(c+dx)^2}{g^4i^2(a+bx)^2(bc-ad)^5}-\frac{12b^2B^2d^2(c+dx)}{g^4i^2(a+bx)(bc-ad)^5}-\frac{2B^2d^4(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{g^4i^2(c+dx)(bc-ad)^5}+\frac{2B^2d^4(a+bx)}{g^4i^2(c+dx)(bc-ad)^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*i*x)^2
),x]
```

```
[Out] (-2*A*B*d^4*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) + (2*B^2*d^4*(a +
b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (12*b^2*B^2*d^2*(c + d*x))/((b*c
- a*d)^5*g^4*i^2*(a + b*x)) + (b^3*B^2*d*(c + d*x)^2)/((b*c - a*d)^5*g^4*i^
2*(a + b*x)^2) - (2*b^4*B^2*(c + d*x)^3)/(27*(b*c - a*d)^5*g^4*i^2*(a + b*x
)^3) - (2*B^2*d^4*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^5*g^
4*i^2*(c + d*x)) - (12*b^2*B*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*B*d*(c + d*x)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2) - (2*b^4*B*
(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^5*g^4*i^2*
(a + b*x)^3) + (d^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c
 - a*d)^5*g^4*i^2*(c + d*x)) - (6*b^2*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x)
```

```
)/(c + d*x)])^2)/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*d*(c + d*x)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2)
- (b^4*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^5
*g^4*i^2*(a + b*x)^3) - (4*b*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3
*B*(b*c - a*d)^5*g^4*i^2)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
```

```
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(99c+99dx)^2(ag+bgx)^4}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^2g^4(a+bx)^4} - \frac{2b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d^2(\ldots}{3267(\ldots}\right.$$

$$= -\frac{(4b^2d^3)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{9801(bc-ad)^5g^4} + \frac{(4bd^4)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{9801(bc-ad)^5g^4} + \frac{(b^2d\ldots}{\ldots}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+\ldots\right.}{3267(bc\ldots}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+\ldots\right.}{3267(bc\ldots}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+\ldots\right.}{3267(bc\ldots}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+\ldots\right.}{3267(bc\ldots}$$

$$= -\frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{88209(bc-ad)^2g^4(a+bx)^3} + \frac{4bBd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{29403(bc-ad)^3g^4(a+bx)^2} - \frac{26bBd^2\ldots}{29403\ldots}$$

$$= -\frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{88209(bc-ad)^2g^4(a+bx)^3} + \frac{4bBd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{29403(bc-ad)^3g^4(a+bx)^2} - \frac{26bBd^2\ldots}{29403\ldots}$$

$$= \frac{4bB^2d^3\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9801(bc-ad)^5g^4} - \frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{88209(bc-ad)^2g^4(a+bx)^3} + \frac{4bB\ldots}{2940\ldots}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{\ldots}{88209(\ldots}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{\ldots}{88209(\ldots}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{\ldots}{88209(\ldots}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{\ldots}{88209(\ldots}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{\ldots}{88209(\ldots}$$

Mathematica [A]
time = 1.29, size = 613, normalized size = 0.90

$$-\frac{-27(A^2-2AB+2B^2)d^3(-bc+ad)(a+bx)^3+b(9A^2+6AB+2B^2)(bc-ad)^3(c+dx)-3b(9A^2+12AB+7B^2)d(bc-ad)^2(a+bx)(c+dx)+3b(27A^2+78AB+92B^2)d^2(bc-ad)(a+bx)^2(c+dx)+6b(18A^2+30AB+55B^2)d^3(a+bx)^3(c+dx)\log(a+bx)+6B(bc-ad)(9(A-B)d^3(a+bx)^3+b(3A+B)(bc-ad)^2(c+dx)-3b(3A+2B)d(bc-ad)(a+bx)(c+dx)+3b(9A+13B)d^2(a+bx)^2(c+dx))\log\left(\frac{e(a+bx)}{c+dx}\right)+9B(-3a^4Bd^4+12a^3bd^3(-Bdx+A(c+dx))+18a^2b^2d^2(2Adx(c+dx)+Bc(c+2dx))+6ab^3d(6Ad^2x^2(c+dx)+B(-c^3+3c^2dx+9cd^2x^2+3d^3x^3))+b^4(12Ad^3x^3(c+dx)+B(c^4-2c^3dx+6c^2d^2x^2+22cd^3x^3+10d^4x^4)))\log^2\left(\frac{e(a+bx)}{c+dx}\right)+36bB^2d^3(a+bx)^3(c+dx)\log^3\left(\frac{e(a+bx)}{c+dx}\right)-6b(18A^2+30AB+55B^2)d^3(a+bx)^3(c+dx)\log(c+dx)}{27(bc-ad)^5g^4i^2(a+bx)^3(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*
i*x)^2),x]
```

```
[Out] -1/27*(-27*(A^2 - 2*A*B + 2*B^2)*d^3*(-(b*c) + a*d)*(a + b*x)^3 + b*(9*A^2
+ 6*A*B + 2*B^2)*(b*c - a*d)^3*(c + d*x) - 3*b*(9*A^2 + 12*A*B + 7*B^2)*d*(
b*c - a*d)^2*(a + b*x)*(c + d*x) + 3*b*(27*A^2 + 78*A*B + 92*B^2)*d^2*(b*c
- a*d)*(a + b*x)^2*(c + d*x) + 6*b*(18*A^2 + 30*A*B + 55*B^2)*d^3*(a + b*x)
^3*(c + d*x)*Log[a + b*x] + 6*B*(b*c - a*d)*(9*(A - B)*d^3*(a + b*x)^3 + b*
(3*A + B)*(b*c - a*d)^2*(c + d*x) - 3*b*(3*A + 2*B)*d*(b*c - a*d)*(a + b*x)
*(c + d*x) + 3*b*(9*A + 13*B)*d^2*(a + b*x)^2*(c + d*x))*Log[(e*(a + b*x))/
(c + d*x)] + 9*B*(-3*a^4*B*d^4 + 12*a^3*b*d^3*(-(B*d*x) + A*(c + d*x)) + 18
*a^2*b^2*d^2*(2*A*d*x*(c + d*x) + B*c*(c + 2*d*x)) + 6*a*b^3*d*(6*A*d^2*x^2
*(c + d*x) + B*(-c^3 + 3*c^2*d*x + 9*c*d^2*x^2 + 3*d^3*x^3)) + b^4*(12*A*d^
3*x^3*(c + d*x) + B*(c^4 - 2*c^3*d*x + 6*c^2*d^2*x^2 + 22*c*d^3*x^3 + 10*d^
4*x^4)))*Log[(e*(a + b*x))/(c + d*x)]^2 + 36*b*B^2*d^3*(a + b*x)^3*(c + d*x
)*Log[(e*(a + b*x))/(c + d*x)]^3 - 6*b*(18*A^2 + 30*A*B + 55*B^2)*d^3*(a +
b*x)^3*(c + d*x)*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2*(a + b*x)^3*(c + d*x)
)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1587 vs. $2(674) = 1348$.
time = 0.95, size = 1588, normalized size = 2.33

method	result	size
derivativedivides	Expression too large to display	1588
default	Expression too large to display	1588
risch	Expression too large to display	2173
norman	Expression too large to display	2748

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/3*d^2*e^2/i^2/(a*d-b*c)^6/g^4*A^2*b^4/(b*e/d+(a*d-b*
c)*e/d/(d*x+c))^3+2*d^3*e/i^2/(a*d-b*c)^6/g^4*A^2*b^3/(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2-6*d^4/i^2/(a*d-b*c)^6/g^4*A^2*b^2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
4*d^5/e/i^2/(a*d-b*c)^6/g^4*A^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+d^6/e^2/i
^2/(a*d-b*c)^6/g^4*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*d^2*e^2/i^2/(a*d-b*c
```

```
)^6/g^4*A*B*b^4*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))-1/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)-8*d^3*e/i^2/(a*d-b*c)^6/g^4
*A*B*b^3*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)+12*d^4/i^2/(a*d-b*c)^6/g^4*A*B*b^2
*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/(b*e/d
+(a*d-b*c)*e/d/(d*x+c)))-4*d^5/e/i^2/(a*d-b*c)^6/g^4*A*B*b*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))^2+2*d^6/e^2/i^2/(a*d-b*c)^6/g^4*A*B*((b*e/d+(a*d-b*c)*e/d/(
d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d)+d^2*e^
2/i^2/(a*d-b*c)^6/g^4*B^2*b^4*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))^2-2/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))-2/27/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)-4*d^3*e/i^2/(a*d-
b*c)^6/g^4*B^2*b^3*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))^2-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)+6*d^4/i^2/(a*d-b*c)^6/g^4*B^2
*b^2*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2/
(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2/(b*e/d+(a*d
-b*c)*e/d/(d*x+c)))-4/3*d^5/e/i^2/(a*d-b*c)^6/g^4*B^2*b*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^3+d^6/e^2/i^2/(a*d-b*c)^6/g^4*B^2*((b*e/d+(a*d-b*c)*e/d/(d*x+c
))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*c)*e/d/(d*x+c)+2*b*e/d))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 5815 vs. $2(643) = 1286$.
time = 0.91, size = 5815, normalized size = 8.53

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] 1/3*B^2*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3
*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*
a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4
*c*d^4 + a^4*b^3*d^5)*g^4*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2
+ 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*x^3 + 3*(a*b^6
*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*
c*d^4 + a^6*b*d^5)*g^4*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3
*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*x + (a^3*b^4*c^5
- 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4) +
 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*
a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4) - 12*b*d^3*log(d*x + c)/((b
^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*
c*d^4 - a^5*d^5)*g^4))*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2 + 2/3*A*B*((1
2*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b
```

^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^2*b*d^3)*
x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^
4*b^3*d^5)*g^4*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^
4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*x^3 + 3*(a*b^6*c^5 - 3*a^
2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6
*b*d^5)*g^4*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 -
6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*x + (a^3*b^4*c^5 - 4*a^4*b^3
*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4) + 12*b*d^3*l
og(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2
*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4) - 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*
a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5
*d^5)*g^4))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 1/27*B^2*(6*(b^4*c^4 - 9
*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*a^3*b*c*d^3 + 9*a^4*d^4 + 30*(b^4*c*
d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^2 + 8*a*b^3*c*d^3 - 19*a^2*b^2*d^4)*
x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*
b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a
)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*
b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(d*x + c
)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 + 57*a^2*b^2*c*d^3 + 19*a^3*b*d^4)*x
+ 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*
c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a) -
6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*(a*
b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^4*d
^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2
*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a))*log(d*x + c)
)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(a^3*b^5*c^6*g^4 - 5*a^4*b^4*c^5*d*g
^4 + 10*a^5*b^3*c^4*d^2*g^4 - 10*a^6*b^2*c^3*d^3*g^4 + 5*a^7*b*c^2*d^4*g^4
- a^8*c*d^5*g^4 + (b^8*c^5*d*g^4 - 5*a*b^7*c^4*d^2*g^4 + 10*a^2*b^6*c^3*d^3
*g^4 - 10*a^3*b^5*c^2*d^4*g^4 + 5*a^4*b^4*c*d^5*g^4 - a^5*b^3*d^6*g^4)*x^4
+ (b^8*c^6*g^4 - 2*a*b^7*c^5*d*g^4 - 5*a^2*b^6*c^4*d^2*g^4 + 20*a^3*b^5*c^3
*d^3*g^4 - 25*a^4*b^4*c^2*d^4*g^4 + 14*a^5*b^3*c*d^5*g^4 - 3*a^6*b^2*d^6*g^
4)*x^3 + 3*(a*b^7*c^6*g^4 - 4*a^2*b^6*c^5*d*g^4 + 5*a^3*b^5*c^4*d^2*g^4 - 5
*a^5*b^3*c^2*d^4*g^4 + 4*a^6*b^2*c*d^5*g^4 - a^7*b*d^6*g^4)*x^2 + (3*a^2*b^
6*c^6*g^4 - 14*a^3*b^5*c^5*d*g^4 + 25*a^4*b^4*c^4*d^2*g^4 - 20*a^5*b^3*c^3*
d^3*g^4 + 5*a^6*b^2*c^2*d^4*g^4 + 2*a^7*b*c*d^5*g^4 - a^8*d^6*g^4)*x) + (2*
b^4*c^4 - 27*a*b^3*c^3*d + 324*a^2*b^2*c^2*d^2 - 245*a^3*b*c*d^3 - 54*a^4*d
^4 + 330*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 36*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4
*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*
c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^3 - 36*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4
*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*
c*d^3 + a^3*b*d^4)*x)*log(d*x + c)^3 + 15*(17*b^4*c^2*d^2 + 32*a*b^3*c*d^3
- 49*a^2*b^2*d^4)*x^2 - 90*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^
3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d
^4)*x)*log(b*x + a)^2 - 18*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 +
3*a*b^3*d^4)*x^3 + 15*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3

```
+ a^3*b*d^4)*x - 6*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x
^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*l
og(b*x + a))*log(d*x + c)^2 - (19*b^4*c^3*d - 567*a*b^3*c^2*d^2 + 87*a^2*b^
2*c*d^3 + 461*a^3*b*d^4)*x + 330*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 +
3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a
^3*b*d^4)*x)*log(b*x + a) - 6*(55*b^4*d^4*x^4 + 55*a^3*b*c*d^3 + 55*(b^4*c*
d^3 + 3*a*b^3*d^4)*x^3 + 165*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 18*(b^4*d^4*
x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 1516 vs. $2(643) = 1286$.
time = 0.45, size = 1516, normalized size = 2.22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] 1/27*((9*A^2 + 6*A*B + 2*B^2)*b^4*c^4 - 27*(2*A^2 + 2*A*B + B^2)*a*b^3*c^3*
d + 162*(A^2 + 2*A*B + 2*B^2)*a^2*b^2*c^2*d^2 - 5*(18*A^2 + 66*A*B + 49*B^2
)*a^3*b*c*d^3 - 27*(A^2 - 2*A*B + 2*B^2)*a^4*d^4 + 6*((18*A^2 + 30*A*B + 55
*B^2)*b^4*c*d^3 - (18*A^2 + 30*A*B + 55*B^2)*a*b^3*d^4)*x^3 + 36*(B^2*b^4*d
^4*x^4 + B^2*a^3*b*c*d^3 + (B^2*b^4*c*d^3 + 3*B^2*a*b^3*d^4)*x^3 + 3*(B^2*a
*b^3*c*d^3 + B^2*a^2*b^2*d^4)*x^2 + (3*B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*x
)*log((b*x + a)*e/(d*x + c))^3 + 3*((18*A^2 + 66*A*B + 85*B^2)*b^4*c^2*d^2
+ 8*(9*A^2 + 6*A*B + 20*B^2)*a*b^3*c*d^3 - (90*A^2 + 114*A*B + 245*B^2)*a^2
*b^2*d^4)*x^2 + 9*(2*(6*A*B + 5*B^2)*b^4*d^4*x^4 + B^2*b^4*c^4 - 6*B^2*a*b^
3*c^3*d + 18*B^2*a^2*b^2*c^2*d^2 + 12*A*B*a^3*b*c*d^3 - 3*B^2*a^4*d^4 + 2*(
(6*A*B + 11*B^2)*b^4*c*d^3 + 9*(2*A*B + B^2)*a*b^3*d^4)*x^3 + 6*(B^2*b^4*c^
2*d^2 + 6*A*B*a^2*b^2*d^4 + 3*(2*A*B + 3*B^2)*a*b^3*c*d^3)*x^2 - 2*(B^2*b^4
*c^3*d - 9*B^2*a*b^3*c^2*d^2 - 18*(A*B + B^2)*a^2*b^2*c*d^3 - 6*(A*B - B^2)
*a^3*b*d^4)*x)*log((b*x + a)*e/(d*x + c))^2 - ((18*A^2 + 30*A*B + 19*B^2)*b
^4*c^3*d - 81*(2*A^2 + 6*A*B + 7*B^2)*a*b^3*c^2*d^2 - 3*(18*A^2 - 114*A*B -
 29*B^2)*a^2*b^2*c*d^3 + (198*A^2 + 114*A*B + 461*B^2)*a^3*b*d^4)*x + 6*((1
8*A^2 + 30*A*B + 55*B^2)*b^4*d^4*x^4 + 18*A^2*a^3*b*c*d^3 + (3*A*B + B^2)*b
^4*c^4 - 9*(2*A*B + B^2)*a*b^3*c^3*d + 54*(A*B + B^2)*a^2*b^2*c^2*d^2 - 9*(
A*B - B^2)*a^4*d^4 + ((18*A^2 + 66*A*B + 85*B^2)*b^4*c*d^3 + 27*(2*A^2 + 2*
A*B + 5*B^2)*a*b^3*d^4)*x^3 + 3*((6*A*B + 11*B^2)*b^4*c^2*d^2 + 9*(2*A^2 +
6*A*B + 7*B^2)*a*b^3*c*d^3 + 18*(A^2 + 2*B^2)*a^2*b^2*d^4)*x^2 - ((6*A*B +
5*B^2)*b^4*c^3*d - 27*(2*A*B + 3*B^2)*a*b^3*c^2*d^2 - 54*(A^2 + 2*A*B + 2*B
^2)*a^2*b^2*c*d^3 - 18*(A^2 - 2*A*B + 2*B^2)*a^3*b*d^4)*x)*log((b*x + a)*e/
(d*x + c)))/((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b^6*c^3*d^3 - 10*a^3*b^5
*c^2*d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*x^4 + (b^8*c^6 - 2*a*b^7*c^5*
d - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*a^4*b^4*c^2*d^4 + 14*a^5*b^
```

```
3*c*d^5 - 3*a^6*b^2*d^6)*g^4*x^3 + 3*(a*b^7*c^6 - 4*a^2*b^6*c^5*d + 5*a^3*b
^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c*d^5 - a^7*b*d^6)*g^4*x^2 + (3*
a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*b^4*c^4*d^2 - 20*a^5*b^3*c^3*d^3 +
5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*d^6)*g^4*x + (a^3*b^5*c^6 - 5*a^4*b
^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a^6*b^2*c^3*d^3 + 5*a^7*b*c^2*d^4 - a^8*
c*d^5)*g^4)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 93.18, size = 711, normalized size = 1.04

$$\frac{\left(18\,B^2b^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{54\,(bxe+ae)B^2bde^3\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+\frac{54\,(bxe+ae)^2B^2d^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)^2}{(dx+c)^2}+36\,ABb^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)+12\,B^2b^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{108\,(bxe+ae)ABbde^3\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}-\frac{54\,(bxe+ae)B^2bde^3\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{108\,(bxe+ae)^2ABd^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+\frac{108\,(bxe+ae)^2B^2d^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+18\,A^2b^2e^4+12\,ABb^2e^4+4\,B^2b^2e^4-\frac{54\,(bxe+ae)A^2bde^3}{dx+c}-\frac{54\,(bxe+ae)ABbde^3}{dx+c}-\frac{27\,(bxe+ae)B^2bde^3}{dx+c}+\frac{54\,(bxe+ae)^2A^2d^2e^2}{(dx+c)^2}+\frac{108\,(bxe+ae)^2ABd^2e^2}{(dx+c)^2}+\frac{108\,(bxe+ae)^2B^2d^2e^2}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)^2}{54\left(\frac{(bxe+ae)^3b^2c^2g^4}{(dx+c)^3}-\frac{2\,(bxe+ae)^3abcdg^4}{(dx+c)^3}+\frac{(bxe+ae)^3a^2d^2g^4}{(dx+c)^3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] 1/54*(18*B^2*b^2*e^4*log((b*x*e + a*e)/(d*x + c))^2 - 54*(b*x*e + a*e)*B^2*
b*d*e^3*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 54*(b*x*e + a*e)^2*B^2*d
^2*e^2*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^2 + 36*A*B*b^2*e^4*log((b*x
*e + a*e)/(d*x + c)) + 12*B^2*b^2*e^4*log((b*x*e + a*e)/(d*x + c)) - 108*(b
*x*e + a*e)*A*B*b*d*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 54*(b*x*e
+ a*e)*B^2*b*d*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 108*(b*x*e + a*
e)^2*A*B*d^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 108*(b*x*e + a*
e)^2*B^2*d^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 18*A^2*b^2*e^4
+ 12*A*B*b^2*e^4 + 4*B^2*b^2*e^4 - 54*(b*x*e + a*e)*A^2*b*d*e^3/(d*x + c) -
 54*(b*x*e + a*e)*A*B*b*d*e^3/(d*x + c) - 27*(b*x*e + a*e)*B^2*b*d*e^3/(d*x
 + c) + 54*(b*x*e + a*e)^2*A^2*d^2*e^2/(d*x + c)^2 + 108*(b*x*e + a*e)^2*A*
B*d^2*e^2/(d*x + c)^2 + 108*(b*x*e + a*e)^2*B^2*d^2*e^2/(d*x + c)^2)*(b*c/(
(b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))^2/((b*x*e
 + a*e)^3*b^2*c^2*g^4/(d*x + c)^3 - 2*(b*x*e + a*e)^3*a*b*c*d*g^4/(d*x + c)
^3 + (b*x*e + a*e)^3*a^2*d^2*g^4/(d*x + c)^3)
```

Mupad [B]
time = 13.57, size = 2701, normalized size = 3.96

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)^4*(c*i + d*i*x)^2
),x)
```

```
[Out] (log((e*(a + b*x))/(c + d*x))*(x^2*((4*B^2*b*d)/(g^4*i^2*(a*d - b*c)^3) - (
4*b*d^3*(b*d*((2*a^2*d^2 + b^2*c^2 - 3*a*b*c*d)/(2*b*d^3) + (a*(a*d - b*c))
/(2*b*d^2)) + ((a*d + b*c)*(a*d - b*c))/d^2)*(5*B^2 + 6*A*B))/(3*g^4*i^2*(a
*d - b*c)^2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) + x*((8*(
2*B^2 - 3*A*B))/(9*g^4*i^2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (4*B^2*(a*d +
 b*c))/(g^4*i^2*(a*d - b*c)^3) - (4*b*d^3*(((2*a^2*d^2 + b^2*c^2 - 3*a*b*c*
d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2))*(a*d + b*c) + (a*c*(a*d - b*c))/d
^2)*(5*B^2 + 6*A*B))/(3*g^4*i^2*(a*d - b*c)^2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*
c^2*d - 3*a^2*b*c*d^2))) - (2*(B^2*b*c - 9*B^2*a*d + 9*A*B*a*d + 3*A*B*b*c)
)/(9*g^4*i^2*(a^2*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) + (4*B^2*a*c)/(g^4*i^
2*(a*d - b*c)^3) - (4*b^2*d^2*x^3*(5*B^2 + 6*A*B))/(3*g^4*i^2*(a*d - b*c)*(
a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (4*a*b*c*d^3*((2*a^2*
d^2 + b^2*c^2 - 3*a*b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2))*(5*B^2 +
6*A*B))/(3*g^4*i^2*(a*d - b*c)^2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2
*b*c*d^2))))/(b^2*x^4 + (a^3*c)/(b*d) + (x*(a^3*d + 3*a^2*b*c))/(b*d) + (x^
3*(b^3*c + 3*a*b^2*d))/(b*d) + (x^2*(3*a*b^2*c + 3*a^2*b*d))/(b*d)) - ((27*
A^2*a^3*d^3 + 9*A^2*b^3*c^3 + 54*B^2*a^3*d^3 + 2*B^2*b^3*c^3 - 54*A*B*a^3*d
^3 + 6*A*B*b^3*c^3 - 45*A^2*a*b^2*c^2*d + 117*A^2*a^2*b*c*d^2 - 25*B^2*a*b^
2*c^2*d + 299*B^2*a^2*b*c*d^2 - 48*A*B*a*b^2*c^2*d + 276*A*B*a^2*b*c*d^2)/(
3*(a*d - b*c)) + (2*x^3*(18*A^2*b^3*d^3 + 55*B^2*b^3*d^3 + 30*A*B*b^3*d^3))
/(a*d - b*c) + (x*(198*A^2*a^2*b*d^3 + 461*B^2*a^2*b*d^3 - 18*A^2*b^3*c^2*d
 - 19*B^2*b^3*c^2*d + 144*A^2*a*b^2*c*d^2 + 548*B^2*a*b^2*c*d^2 + 114*A*B*a
^2*b*d^3 - 30*A*B*b^3*c^2*d + 456*A*B*a*b^2*c*d^2))/(3*(a*d - b*c)) + (x^2*
(90*A^2*a*b^2*d^3 + 245*B^2*a*b^2*d^3 + 18*A^2*b^3*c*d^2 + 85*B^2*b^3*c*d^2
 + 114*A*B*a*b^2*d^3 + 66*A*B*b^3*c*d^2))/(a*d - b*c))/(x*(9*a^6*d^4*g^4*i^
2 - 27*a^2*b^4*c^4*g^4*i^2 + 72*a^3*b^3*c^3*d*g^4*i^2 - 54*a^4*b^2*c^2*d^2*
g^4*i^2) - x^2*(27*a*b^5*c^4*g^4*i^2 - 27*a^5*b*d^4*g^4*i^2 - 54*a^2*b^4*c^
3*d*g^4*i^2 + 54*a^4*b^2*c*d^3*g^4*i^2) - x^3*(9*b^6*c^4*g^4*i^2 - 27*a^4*b
^2*d^4*g^4*i^2 + 72*a^3*b^3*c*d^3*g^4*i^2 - 54*a^2*b^4*c^2*d^2*g^4*i^2) + x
^4*(9*a^3*b^3*d^4*g^4*i^2 - 9*b^6*c^3*d*g^4*i^2 + 27*a*b^5*c^2*d^2*g^4*i^2
- 27*a^2*b^4*c*d^3*g^4*i^2) - 9*a^3*b^3*c^4*g^4*i^2 + 9*a^6*c*d^3*g^4*i^2 +
 27*a^4*b^2*c^3*d*g^4*i^2 - 27*a^5*b*c^2*d^2*g^4*i^2) - log((e*(a + b*x))/(
c + d*x))^2*((x*((4*B^2)/(3*g^4*i^2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (4*B
^2*b*d^3*(((2*a^2*d^2 + b^2*c^2 - 3*a*b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2
*b*d^2))*(a*d + b*c) + (a*c*(a*d - b*c))/d^2))/(g^4*i^2*(a*d - b*c)^2*(a^3*
d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) + (B^2*(3*a*d + b*c))/(3*g
^4*i^2*(a^2*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) + (4*B^2*b^2*d^2*x^3)/(g^4*
i^2*(a*d - b*c)*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (4*B
^2*b*d^3*x^2*(b*d*((2*a^2*d^2 + b^2*c^2 - 3*a*b*c*d)/(2*b*d^3) + (a*(a*d -
b*c))/(2*b*d^2)) + ((a*d + b*c)*(a*d - b*c))/d^2))/(g^4*i^2*(a*d - b*c)^2*(
```

```
a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (4*B^2*a*b*c*d^3*((2*
a^2*d^2 + b^2*c^2 - 3*a*b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)))/(g^4
*i^2*(a*d - b*c)^2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)))/(b
^2*x^4 + (a^3*c)/(b*d) + (x*(a^3*d + 3*a^2*b*c))/(b*d) + (x^3*(b^3*c + 3*a*
b^2*d))/(b*d) + (x^2*(3*a*b^2*c + 3*a^2*b*d))/(b*d)) - (2*b*d^3*(5*B^2 + 6*
A*B))/(3*g^4*i^2*(a*d - b*c)^2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b
*c*d^2))) - (b*d^3*atan((b*d^3*(18*A^2 + 55*B^2 + 30*A*B)*(9*a^5*d^5*g^4*i^
2 + 9*b^5*c^5*g^4*i^2 - 27*a*b^4*c^4*d*g^4*i^2 - 27*a^4*b*c*d^4*g^4*i^2 + 1
8*a^2*b^3*c^3*d^2*g^4*i^2 + 18*a^3*b^2*c^2*d^3*g^4*i^2)*2i)/(9*g^4*i^2*(a*d
 - b*c)^5*(36*A^2*b*d^3 + 110*B^2*b*d^3 + 60*A*B*b*d^3)) + (b^2*d^4*x*(18*A
^2 + 55*B^2 + 30*A*B)*(a^4*d^4*g^4*i^2 + b^4*c^4*g^4*i^2 - 4*a*b^3*c^3*d*g^
4*i^2 - 4*a^3*b*c*d^3*g^4*i^2 + 6*a^2*b^2*c^2*d^2*g^4*i^2)*4i)/(g^4*i^2*(a*
d - b*c)^5*(36*A^2*b*d^3 + 110*B^2*b*d^3 + 60*A*B*b*d^3)))*(18*A^2 + 55*B^2
 + 30*A*B)*4i)/(9*g^4*i^2*(a*d - b*c)^5) + (4*B^2*b*d^3*log((e*(a + b*x))/(
c + d*x))^3)/(3*g^4*i^2*(a*d - b*c)^2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d -
3*a^2*b*c*d^2))
```

3.100 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=635

$$\frac{B^2(bc-ad)g^3(a+bx)^2}{4d^2i^3(c+dx)^2}-\frac{4AbB(bc-ad)g^3(a+bx)}{d^3i^3(c+dx)}+\frac{4bB^2(bc-ad)g^3(a+bx)}{d^3i^3(c+dx)}-\frac{4bB^2(bc-ad)g^3(a+bx)\,\mathrm{l}}{d^3i^3(c+dx)}$$

```
[Out] 1/4*B^2*(-a*d+b*c)*g^3*(b*x+a)^2/d^2/i^3/(d*x+c)^2-4*A*b*B*(-a*d+b*c)*g^3*(
b*x+a)/d^3/i^3/(d*x+c)+4*b*B^2*(-a*d+b*c)*g^3*(b*x+a)/d^3/i^3/(d*x+c)-4*b*B
^2*(-a*d+b*c)*g^3*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/d^3/i^3/(d*x+c)-1/2*B*(-a*d
+b*c)*g^3*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^2/i^3/(d*x+c)^2+2*b^2*B*(
-a*d+b*c)*g^3*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/d^4/i^3+
b^2*g^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^3/i^3+1/2*(-a*d+b*c)*g^3*(b
*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^2/i^3/(d*x+c)^2+2*b*(-a*d+b*c)*g^3*
(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^3/i^3/(d*x+c)+3*b^2*(-a*d+b*c)*g^3*
ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^4/i^3+2*b^2*B^2*(-
a*d+b*c)*g^3*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i^3+6*b^2*B*(-a*d+b*c)*g^3*
(A+B*ln(e*(b*x+a)/(d*x+c)))*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i^3-6*b^2*B^
2*(-a*d+b*c)*g^3*polylog(3,d*(b*x+a)/b/(d*x+c))/d^4/i^3
```

Rubi [A]
time = 0.38, antiderivative size = 635, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$, Rules used = {2562, 2395, 2333, 2332, 2342, 2341, 2355, 2354, 2438, 2421, 6724}

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^
3,x]
```

```
[Out] (B^2*(b*c - a*d)*g^3*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (4*A*b*B*(b*c -
 a*d)*g^3*(a + b*x))/(d^3*i^3*(c + d*x)) + (4*b*B^2*(b*c - a*d)*g^3*(a + b*
x))/(d^3*i^3*(c + d*x)) - (4*b*B^2*(b*c - a*d)*g^3*(a + b*x)*Log[(e*(a + b*
x))/(c + d*x)])/(d^3*i^3*(c + d*x)) - (B*(b*c - a*d)*g^3*(a + b*x)^2*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^3*(c + d*x)^2) + (2*b^2*B*(b*c - a
*d)*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(d^4*i^3) + (b^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d
^3*i^3) + ((b*c - a*d)*g^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2)/(2*d^2*i^3*(c + d*x)^2) + (2*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)])^2)/(d^3*i^3*(c + d*x)) + (3*b^2*(b*c - a*d)*g^3*Log[
(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^4*i^3
) + (2*b^2*B^2*(b*c - a*d)*g^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^
```

```
4*i^3) + (6*b^2*B*(b*c - a*d)*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3
*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
```

```
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(100c+100dx)^3}\,dx = \int \left(\frac{b^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(-bc+ad)^3g^3\left(A+B\log\left(\right.\right.}{1000000d^3(c+dx)}\right.$$

$$= \frac{(b^3g^3)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{1000000d^3} - \frac{(3b^2(bc-ad)g^3)\int \frac{(A+B}{}}{1000000d^3}$$

$$= \frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{2000000d^4(c+dx)^2}$$

$$= \frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{2000000d^4(c+dx)^2}$$

$$= \frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{2000000d^4(c+dx)^2}$$

$$= \frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{2000000d^4(c+dx)^2}$$

$$= -\frac{B(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2000000d^4(c+dx)^2} + \frac{bB(bc-ad)^2g^3\left(A+\right.}{200000d^4(c}$$

$$= -\frac{B(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2000000d^4(c+dx)^2} + \frac{bB(bc-ad)^2g^3\left(A+\right.}{200000d^4(c}$$

$$= -\frac{B(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2000000d^4(c+dx)^2} + \frac{bB(bc-ad)^2g^3\left(A+\right.}{200000d^4(c}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3}{2000000}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3}{2000000}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3}{2000000}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3}{2000000}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3}{2000000}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 6052 vs. $2(635) = 1270$.
time = 7.20, size = 6052, normalized size = 9.53

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x)^3,x]
```

```
[Out] Result too large to show
```

Maple [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^3 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] -2*(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*lo
g(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c
 - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*
b*c^2*d^2 - I*a*c*d^3)*x) - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^3*x
^2 + 4*I*c*d^2*x + 2*I*c^2*d))*A*B*a^3*g^3 - 6*A*B*a^2*b*g^3*((b^2*c - 2*a*
b*d)*log(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c
- 2*a*b*d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (
2*d*x + c)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^4*x^2 + 4*I*c*d^3*x
+ 2*I*c^2*d^2) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2
+ 4*I*a*c^2*d^3 - 4*(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)
*x)) + A^2*b^3*g^3*((6*c^2*d*x + 5*c^3)/(2*I*d^6*x^2 + 4*I*c*d^5*x + 2*I*c^
2*d^4) + I*x/d^3 - 3*I*c*log(d*x + c)/d^4) - 3*A^2*a*b^2*g^3*((4*c*d*x + 3*
c^2)/(2*I*d^5*x^2 + 4*I*c*d^4*x + 2*I*c^2*d^3) - I*log(d*x + c)/d^3) + 3*(2
```

```
*d*x + c)*A^2*a^2*b*g^3/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + A^2*a^3
*g^3/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) - 1/2*(2*((I*b^3*c*d^2*g^3 - I
*a*b^2*d^3*g^3)*B^2*x^2 + 2*(I*b^3*c^2*d*g^3 - I*a*b^2*c*d^2*g^3)*B^2*x + (
I*b^3*c^3*g^3 - I*a*b^2*c^2*d*g^3)*B^2)*log(d*x + c)^3 - (2*I*B^2*b^3*d^3*g
^3*x^3 + 4*I*B^2*b^3*c*d^2*g^3*x^2 - 2*(2*I*b^3*c^2*d*g^3 - 6*I*a*b^2*c*d^2
*g^3 + 3*I*a^2*b*d^3*g^3)*B^2*x + (-5*I*b^3*c^3*g^3 + 9*I*a*b^2*c^2*d*g^3 -
 3*I*a^2*b*c*d^2*g^3 - I*a^3*d^3*g^3)*B^2)*log(d*x + c)^2)/(d^6*x^2 + 2*c*d
^5*x + c^2*d^4) - integrate((-3*I*B^2*a^2*b*d^3*g^3*x - I*B^2*a^3*d^3*g^3 +
 (-2*I*A*B*b^3*d^3*g^3 - I*B^2*b^3*d^3*g^3)*x^3 - 3*(2*I*A*B*a*b^2*d^3*g^3
+ I*B^2*a*b^2*d^3*g^3)*x^2 + (-I*B^2*b^3*d^3*g^3*x^3 - 3*I*B^2*a*b^2*d^3*g^
3*x^2 - 3*I*B^2*a^2*b*d^3*g^3*x - I*B^2*a^3*d^3*g^3)*log(b*x + a)^2 - 2*(3*
I*B^2*a^2*b*d^3*g^3*x + I*B^2*a^3*d^3*g^3 + (I*A*B*b^3*d^3*g^3 + I*B^2*b^3*
d^3*g^3)*x^3 + 3*(I*A*B*a*b^2*d^3*g^3 + I*B^2*a*b^2*d^3*g^3)*x^2)*log(b*x +
 a) - (4*(I*b^3*c^2*d*g^3 - 3*I*a*b^2*c*d^2*g^3)*B^2*x + 2*(-I*A*B*b^3*d^3*
g^3 - 2*I*B^2*b^3*d^3*g^3)*x^3 - (-5*I*b^3*c^3*g^3 + 9*I*a*b^2*c^2*d*g^3 -
3*I*a^2*b*c*d^2*g^3 + I*a^3*d^3*g^3)*B^2 + 2*(-3*I*A*B*a*b^2*d^3*g^3 + (-2*
I*b^3*c*d^2*g^3 - 3*I*a*b^2*d^3*g^3)*B^2)*x^2 + 2*(-I*B^2*b^3*d^3*g^3*x^3 -
 3*I*B^2*a*b^2*d^3*g^3*x^2 - 3*I*B^2*a^2*b*d^3*g^3*x - I*B^2*a^3*d^3*g^3)*l
og(b*x + a))*log(d*x + c))/(d^6*x^3 + 3*c*d^5*x^2 + 3*c^2*d^4*x + c^3*d^3),
 x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] integral((I*A^2*b^3*g^3*x^3 + 3*I*A^2*a*b^2*g^3*x^2 + 3*I*A^2*a^2*b*g^3*x +
 I*A^2*a^3*g^3 + (I*B^2*b^3*g^3*x^3 + 3*I*B^2*a*b^2*g^3*x^2 + 3*I*B^2*a^2*b
*g^3*x + I*B^2*a^3*g^3)*log((b*x + a)*e/(d*x + c))^2 - 2*(-I*A*B*b^3*g^3*x^
3 - 3*I*A*B*a*b^2*g^3*x^2 - 3*I*A*B*a^2*b*g^3*x - I*A*B*a^3*g^3)*log((b*x +
 a)*e/(d*x + c)))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(I*d*x + I*c
)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^3\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{(c\,i+d\,i\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^
3,x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^
3, x)
```

3.101 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=410

$$-\frac{B^2g^2(a+bx)^2}{4di^3(c+dx)^2}+\frac{2AbBg^2(a+bx)}{d^2i^3(c+dx)}-\frac{2bB^2g^2(a+bx)}{d^2i^3(c+dx)}+\frac{2bB^2g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^2i^3(c+dx)}+\frac{Bg^2(a+bx)^2\left(A+B\right.}{2di^3(c+d\right.}$$

```
[Out] -1/4*B^2*g^2*(b*x+a)^2/d/i^3/(d*x+c)^2+2*A*b*B*g^2*(b*x+a)/d^2/i^3/(d*x+c)-
2*b*B^2*g^2*(b*x+a)/d^2/i^3/(d*x+c)+2*b*B^2*g^2*(b*x+a)*ln(e*(b*x+a)/(d*x+c
))/d^2/i^3/(d*x+c)+1/2*B*g^2*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/d/i^3/(d
*x+c)^2-1/2*g^2*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d/i^3/(d*x+c)^2-b*g
^2*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^2/i^3/(d*x+c)-b^2*g^2*ln((-a*d+b
*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/d^3/i^3-2*b^2*B*g^2*(A+B*ln(e*
(b*x+a)/(d*x+c)))*polylog(2,d*(b*x+a)/b/(d*x+c))/d^3/i^3+2*b^2*B^2*g^2*poly
log(3,d*(b*x+a)/b/(d*x+c))/d^3/i^3
```

Rubi [A]
time = 0.27, antiderivative size = 410, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {2562, 2395, 2333, 2332, 2342, 2341, 2354, 2421, 6724}

$$-\frac{2b^2Bg^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^3}+\frac{2b^2B^2g^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^3}-\frac{b^2g^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^3i^3}-\frac{bg^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{d^2i^3(c+dx)}+\frac{2AbBg^2(a+bx)}{d^2i^3(c+dx)}-\frac{g^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2di^3(c+dx)^2}+\frac{Bg^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2di^3(c+dx)^2}+\frac{2bB^2g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{d^2i^3(c+dx)}-\frac{2bB^2g^2(a+bx)}{d^2i^3(c+dx)}-\frac{B^2g^2(a+bx)^2}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^
3,x]
```

```
[Out] -1/4*(B^2*g^2*(a + b*x)^2)/(d*i^3*(c + d*x)^2) + (2*A*b*B*g^2*(a + b*x))/(d
^2*i^3*(c + d*x)) - (2*b*B^2*g^2*(a + b*x))/(d^2*i^3*(c + d*x)) + (2*b*B^2*
g^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(d^2*i^3*(c + d*x)) + (B*g^2*(a
 + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d*i^3*(c + d*x)^2) - (g^
2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*d*i^3*(c + d*x)^2)
 - (b*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^3*(c + d
*x)) - (b^2*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])^2)/(d^3*i^3) - (2*b^2*B*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*P
olyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3) + (2*b^2*B^2*g^2*PolyLog[
3, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
```

```
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(101c+101dx)^3}\,dx = \int \left(\frac{(-bc+ad)^2 g^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1030301d^2(c+dx)^3} - \frac{2b(bc-ad)g^2\left(\right.}{103030}\right.$$

$$= \frac{(b^2g^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{1030301d^2} - \frac{(2b(bc-ad)g^2)\int \frac{\left(A+B\log\left(\frac{e(a+}{c+}\right.\right.}{(c+dx)^2}}{1030301d^2}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2060602d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+\right.}{1030301d^3(}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2060602d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+\right.}{1030301d^3(}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2060602d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+\right.}{1030301d^3(}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2060602d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+\right.}{1030301d^3(}$$

$$= \frac{B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2060602d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2\left(A+\right.}{1030301d^3(}$$

$$= \frac{B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2060602d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2\left(A+\right.}{1030301d^3(}$$

$$= \frac{B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2060602d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2\left(A+\right.}{1030301d^3(}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a}{2060602d^3}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a}{2060602d^3}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a}{2060602d^3}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a}{2060602d^3}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a}{2060602d^3}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 2950 vs. $2(410) = 820$.
time = 3.02, size = 2950, normalized size = 7.20

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x)^3,x]
```

```
[Out] (g^2*((-2*A^2*(b*c - a*d)^2)/(c + d*x)^2 + (8*A^2*b*(b*c - a*d))/(c + d*x)
+ 4*A^2*b^2*Log[c + d*x] - (4*a*A*b*B*d*(-(b^2*c^3) + 4*a*b*c^2*d - 3*a^2*c
*d^2 - 2*b^2*c^2*d*x + 6*a*b*c*d^2*x - 4*a^2*d^3*x - 2*b*(b*c - 2*a*d)*(c +
 d*x)^2*Log[a + b*x] + 2*(b*c - a*d)^2*(c + 2*d*x)*Log[(e*(a + b*x))/(c + d
*x)] + 2*b^2*c^3*Log[c + d*x] - 4*a*b*c^2*d*Log[c + d*x] + 4*b^2*c^2*d*x*Lo
g[c + d*x] - 8*a*b*c*d^2*x*Log[c + d*x] + 2*b^2*c*d^2*x^2*Log[c + d*x] - 4*
a*b*d^3*x^2*Log[c + d*x]))/((b*c - a*d)^2*(c + d*x)^2) - (2*a^2*A*B*d^2*(-(
b^2*c^2) + 4*a*b*c*d - a^2*d^2 + 2*b^2*c*d*x + 2*a*b*d^2*x + 2*b^2*d^2*x^2
- 2*b^2*(c + d*x)^2*Log[a/b + x] + 2*(b*c - a*d)^2*Log[(e*(a + b*x))/(c + d
*x)] + 2*b^2*c^2*Log[(b*(c + d*x))/(b*c - a*d)] + 4*b^2*c*d*x*Log[(b*(c + d
*x))/(b*c - a*d)] + 2*b^2*d^2*x^2*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c -
a*d)^2*(c + d*x)^2) + 2*A*b^2*B*(-2*Log[c/d + x]^2 - (8*c*(1 + Log[c/d + x]
))/(c + d*x) + (c^2*(1 + 2*Log[c/d + x]))/(c + d*x)^2 + 8*c*(Log[a/b + x]/(
c + d*x) + (b*(Log[a + b*x] - Log[c + d*x]))/(-(b*c) + a*d)) + 2*(-Log[a/b
+ x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)])*((c*(3*c + 4*d*x))/(c +
 d*x)^2 + 2*Log[c + d*x]) + (2*c^2*(-Log[a/b + x] + (b*(c + d*x)*(b*c - a*d
 + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]))/(b*c - a*d)^2))/(c
 + d*x)^2 + 4*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)])) + (2*a*b*B^2*d*(2*c*Log[(e*(a + b*x))/(c + d*x
)]^2 - 4*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^2 - (4*(c + d*x)*(2*b*c - 2
*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*
x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*
x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d
)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c +
d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] +
 Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
))/(b*c - a*d) + (c*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c +
 d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(e*(a + b*x))/(c + d*x)] - 4*b*(
b*c - a*d)*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)] - 4*b^2*(c + d*x)^2*Log[a
 + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4*b
*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]
) - 4*b^2*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b
*d*x)] + 2*b^2*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x)
)/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c +
```

```
d*x)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
 + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])))/(b*c - a*d)^2))/(c + d*x)^2 - (a^2*B^2*d^2*((b*c - a*d)^2 + 2*b*(b*c -
 a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(e*(
a + b*x))/(c + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*Log[(e*(a + b*x))/(c + d*x
)] - 4*b^2*(c + d*x)^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 2*(b*c -
 a*d)^2*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4
*b*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*
x]) - 4*b^2*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c +
 b*d*x)] + 2*b^2*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c
+ d*x)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*
d)])))/((b*c - a*d)^2*(c + d*x)^2) - 2*b^2*B^2*((c^2*Log[(e*(a + b*x))/(c +
 d*x)]^2)/(c + d*x)^2 - (4*c*Log[(e*(a + b*x))/(c + d*x)]^2)/(c + d*x) + 2*
Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 4*Log[(e*(a
 + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - (4*c*(2*b*c -
 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c +
d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c +
d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a
*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
+ d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c
+ d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
 + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])))/((b*c - a*d)*(c + d*x)) + (c^2*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d
*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(e*(a + b*x))/(c
 + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)] - 4*b^2*(
c + d*x)^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b^2*(c + d*x)^2*Lo
g[c + d*x] + 4*b*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d
*x)*Log[c + d*x]) - 4*b^2*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c
 - a*d)/(b*c + b*d*x)] + 2*b^2*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*
Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, ...
```

Maple [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^2 \left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] -2*(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*lo
g(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c
 - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*
b*c^2*d^2 - I*a*c*d^3)*x) - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^3*x
^2 + 4*I*c*d^2*x + 2*I*c^2*d))*A*B*a^2*g^2 - 4*A*B*a*b*g^2*((b^2*c - 2*a*b*
d)*log(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c -
2*a*b*d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (2*
d*x + c)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^4*x^2 + 4*I*c*d^3*x +
2*I*c^2*d^2) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 +
4*I*a*c^2*d^3 - 4*(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x
)) - A^2*b^2*g^2*((4*c*d*x + 3*c^2)/(2*I*d^5*x^2 + 4*I*c*d^4*x + 2*I*c^2*d^
3) - I*log(d*x + c)/d^3) + 2*(2*d*x + c)*A^2*a*b*g^2/(2*I*d^4*x^2 + 4*I*c*d
^3*x + 2*I*c^2*d^2) + A^2*a^2*g^2/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) -
 1/6*(2*(-I*B^2*b^2*d^2*g^2*x^2 - 2*I*B^2*b^2*c*d*g^2*x - I*B^2*b^2*c^2*g^2
)*log(d*x + c)^3 + 3*(4*(-I*b^2*c*d*g^2 + I*a*b*d^2*g^2)*B^2*x + (-3*I*b^2*
c^2*g^2 + 2*I*a*b*c*d*g^2 + I*a^2*d^2*g^2)*B^2)*log(d*x + c)^2)/(d^5*x^2 +
2*c*d^4*x + c^2*d^3) - integrate((-2*I*B^2*a*b*d^2*g^2*x - I*B^2*a^2*d^2*g^
2 + (-2*I*A*B*b^2*d^2*g^2 - I*B^2*b^2*d^2*g^2)*x^2 + (-I*B^2*b^2*d^2*g^2*x^
2 - 2*I*B^2*a*b*d^2*g^2*x - I*B^2*a^2*d^2*g^2)*log(b*x + a)^2 - 2*(2*I*B^2*
a*b*d^2*g^2*x + I*B^2*a^2*d^2*g^2 + (I*A*B*b^2*d^2*g^2 + I*B^2*b^2*d^2*g^2)
*x^2)*log(b*x + a) + (4*I*B^2*b^2*c*d*g^2*x + (3*I*b^2*c^2*g^2 - 2*I*a*b*c*
d*g^2 + I*a^2*d^2*g^2)*B^2 - 2*(-I*A*B*b^2*d^2*g^2 - I*B^2*b^2*d^2*g^2)*x^2
 - 2*(-I*B^2*b^2*d^2*g^2*x^2 - 2*I*B^2*a*b*d^2*g^2*x - I*B^2*a^2*d^2*g^2)*l
og(b*x + a))*log(d*x + c))/(d^5*x^3 + 3*c*d^4*x^2 + 3*c^2*d^3*x + c^3*d^2),
 x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] integral((I*A^2*b^2*g^2*x^2 + 2*I*A^2*a*b*g^2*x + I*A^2*a^2*g^2 + (I*B^2*b^
2*g^2*x^2 + 2*I*B^2*a*b*g^2*x + I*B^2*a^2*g^2)*log((b*x + a)*e/(d*x + c))^2
```

```
 - 2*(-I*A*B*b^2*g^2*x^2 - 2*I*A*B*a*b*g^2*x - I*A*B*a^2*g^2)*log((b*x + a)
*e/(d*x + c)))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(I*d*x + I*c
)^3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^2\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{(c\,i+d\,i\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^
3,x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^
3, x)
```

3.102 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=141

$$\frac{B^2g(a+bx)^2}{4(bc-ad)i^3(c+dx)^2}-\frac{Bg(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2(bc-ad)i^3(c+dx)^2}+\frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2(bc-ad)i^3(c+dx)^2}$$

```
[Out] 1/4*B^2*g*(b*x+a)^2/(-a*d+b*c)/i^3/(d*x+c)^2-1/2*B*g*(b*x+a)^2*(A+B*ln(e*(b
*x+a)/(d*x+c)))/(-a*d+b*c)/i^3/(d*x+c)^2+1/2*g*(b*x+a)^2*(A+B*ln(e*(b*x+a)/
(d*x+c)))^2/(-a*d+b*c)/i^3/(d*x+c)^2
```

Rubi [A]

time = 0.08, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.075$, Rules used = {2562, 2342, 2341}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2i^3(c+dx)^2(bc-ad)}-\frac{Bg(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2i^3(c+dx)^2(bc-ad)}+\frac{B^2g(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^3,
x]
```

```
[Out] (B^2*g*(a + b*x)^2)/(4*(b*c - a*d)*i^3*(c + d*x)^2) - (B*g*(a + b*x)^2*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)*i^3*(c + d*x)^2) + (g*(a +
 b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)*i^3*(c + d*x
)^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
```

```
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(102c+102dx)^3}\,dx = \int \Bigg(\frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d(c+dx)^3} + \frac{bg\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{1061208d(c+d}$$

$$= \frac{(bg)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^2}\,dx}{1061208d} - \frac{((bc-ad)g)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^3}\,d}{1061208d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2122416d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d^2(c+dx)}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2122416d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d^2(c+dx)}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2122416d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d^2(c+dx)}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2122416d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d^2(c+dx)}$$

$$= -\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2122416d^2(c+dx)^2} + \frac{bBg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{1061208d^2(c+dx)}$$

$$= -\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2122416d^2(c+dx)^2} + \frac{bBg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{1061208d^2(c+dx)}$$

$$= -\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2122416d^2(c+dx)^2} + \frac{bBg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{1061208d^2(c+dx)}$$

$$= \frac{B^2(bc-ad)g}{4244832d^2(c+dx)^2} - \frac{bB^2g}{2122416d^2(c+dx)} - \frac{b^2B^2g\log(a+bx)}{2122416d^2(bc-ad}$$

$$= \frac{B^2(bc-ad)g}{4244832d^2(c+dx)^2} - \frac{bB^2g}{2122416d^2(c+dx)} - \frac{b^2B^2g\log(a+bx)}{2122416d^2(bc-ad}$$

$$= \frac{B^2(bc-ad)g}{4244832d^2(c+dx)^2} - \frac{bB^2g}{2122416d^2(c+dx)} - \frac{b^2B^2g\log(a+bx)}{2122416d^2(bc-ad}$$

$$= \frac{B^2(bc-ad)g}{4244832d^2(c+dx)^2} - \frac{bB^2g}{2122416d^2(c+dx)} - \frac{b^2B^2g\log(a+bx)}{2122416d^2(bc-ad}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order

3 in optimal.
time = 0.58, size = 767, normalized size = 5.44

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i
*x)^3,x]
```

```
[Out] (g*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 4*b*(b*c - a*d
)*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 4*b*B*(c + d*x)*(2*(b*
c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b*(c + d*x)*Log[a + b*x]*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*b*(c + d*x)*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x] - 2*B*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b
*(c + d*x)*Log[c + d*x]) - b*B*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Lo
g[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
 + b*B*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[
c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) - B*(2*(b*c - a*d)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*b*(b*c - a*d)*(c + d*x)*(A + B*Log[
(e*(a + b*x))/(c + d*x)]) + 4*b^2*(c + d*x)^2*Log[a + b*x]*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]) - 4*b^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)
])*Log[c + d*x] - 4*b*B*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b
*(c + d*x)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2
*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]) - 2*b^2*B*(
c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
- 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*(c + d*x)^2*((2*Log
[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)]))))/(4*d^2*(b*c - a*d)*i^3*(c + d*x)^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 360 vs. $2(135) = 270$.
time = 0.55, size = 361, normalized size = 2.56

method	result
norman	$\frac{-\frac{2A^2adg+2A^2bcg-2dgaBA-2cbgBA+dgaB^2+cbgB^2}{4i\,d^2}-\frac{\left(2A^2bg-2bgBA+bgB^2\right)x}{2id}-\frac{B^2a^2g\ln\left(\frac{e(bx+a)}{dx+c}\right)^2}{2i(ad-cb)}-\frac{B^2b^2g\,x^2\ln\left(\frac{e(bx+\cdots}{dx+\cdots}\right.}{2(ad-cb)i}}{i^2(d\cdots}$
derivativedivides	$-\frac{e(ad-cb)\left(\frac{g\,d^2A^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2(ad-cb)^2e^3i^3}+\frac{2g\,d^2AB\left(\frac{\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{2}-\frac{\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{4}\right)}{(ad-cb)^2e^3i^3}+\frac{g\,d^2B^2\left(\left(\cdots\right.\right.}{\cdots}\right.}{d^2}$

default	$-\frac{e(ad-cb)\left(\frac{g\,d^2A^2\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{2(ad-cb)^2e^3i^3}+\frac{2g\,d^2AB\left(\frac{\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2\ln\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)}{2}-\frac{\left(\frac{be}{d}+\frac{(ad-cb)e}{d(dx+c)}\right)^2}{4}\right)}{(ad-cb)^2e^3i^3}+\frac{g\,d^2B^2\left(\left(\frac{be}{d}\right.\right.}{}\right.}{d^2}$
risch	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/2*g*d^2/(a*d-b*c)^2/e^3/i^3*A^2*(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2+2*g*d^2/(a*d-b*c)^2/e^3/i^3*A*B*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c
))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)+g
*d^2/(a*d-b*c)^2/e^3/i^3*B^2*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))^2-1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))+1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1867 vs. $2(128) = 256$.
time = 0.49, size = 1867, normalized size = 13.24

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] (2*d*x + c)*B^2*b*g*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(2*I*d^4*x^2 + 4
*I*c*d^3*x + 2*I*c^2*d^2) - 2*(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*
d^2 + 2*I*a^2*d^3) - b^2*log(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*
a^2*d^3) - (2*b*d*x + 3*b*c - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c
*d^3 - I*a*d^4)*x^2 - 8*(I*b*c^2*d^2 - I*a*c*d^3)*x) - log(b*x*e/(d*x + c)
+ a*e/(d*x + c))/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d))*A*B*a*g - 1/4*(8*
(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(d
*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c -
a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*c
^2*d^2 - I*a*c*d^3)*x))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + (7*I*b^2*c^2
 - 8*I*a*b*c*d + I*a^2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)
*log(b*x + a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(d*x +
c)^2 - 6*(-I*b^2*c*d + I*a*b*d^2)*x - 6*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I
*b^2*c^2)*log(b*x + a) - 2*(3*I*b^2*d^2*x^2 + 6*I*b^2*c*d*x + 3*I*b^2*c^2 +
 2*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)*log(b*x + a))*log(d*x + c))/
(b^2*c^4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3 + (b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2
```

```
*d^5)*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*x))*B^2*a*g - 1/4*(
8*((b^2*c - 2*a*b*d)*log(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^
2*d^4) - (b^2*c - 2*a*b*d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 +
2*I*a^2*d^4) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 +
4*I*a*c^2*d^3 - 4*(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x
))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) - (-I*b^2*c^3 + 8*I*a*b*c^2*d - 7*I
*a^2*c*d^2 - 2*(I*b^2*c^3 - 2*I*a*b*c^2*d + (I*b^2*c*d^2 - 2*I*a*b*d^3)*x^2
 + 2*(I*b^2*c^2*d - 2*I*a*b*c*d^2)*x)*log(b*x + a)^2 - 2*(I*b^2*c^3 - 2*I*a
*b*c^2*d + (I*b^2*c*d^2 - 2*I*a*b*d^3)*x^2 + 2*(I*b^2*c^2*d - 2*I*a*b*c*d^2
)*x)*log(d*x + c)^2 - 2*(I*b^2*c^2*d - 5*I*a*b*c*d^2 + 4*I*a^2*d^3)*x - 2*(
I*b^2*c^3 - 4*I*a*b*c^2*d + (I*b^2*c*d^2 - 4*I*a*b*d^3)*x^2 + 2*(I*b^2*c^2*
d - 4*I*a*b*c*d^2)*x)*log(b*x + a) - 2*(-I*b^2*c^3 + 4*I*a*b*c^2*d + (-I*b^
2*c*d^2 + 4*I*a*b*d^3)*x^2 + 2*(-I*b^2*c^2*d + 4*I*a*b*c*d^2)*x + 2*(-I*b^2
*c^3 + 2*I*a*b*c^2*d + (-I*b^2*c*d^2 + 2*I*a*b*d^3)*x^2 + 2*(-I*b^2*c^2*d +
 2*I*a*b*c*d^2)*x)*log(b*x + a))*log(d*x + c))/(b^2*c^4*d^2 - 2*a*b*c^3*d^3
 + a^2*c^2*d^4 + (b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*x^2 + 2*(b^2*c^3*d^3
 - 2*a*b*c^2*d^4 + a^2*c*d^5)*x))*B^2*b*g - 2*A*B*b*g*((b^2*c - 2*a*b*d)*lo
g(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c - 2*a*b
*d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (2*d*x +
 c)*log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c
^2*d^2) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a
*c^2*d^3 - 4*(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) +
B^2*a*g*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2/(2*I*d^3*x^2 + 4*I*c*d^2*x +
 2*I*c^2*d) + (2*d*x + c)*A^2*b*g/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2)
 + A^2*a*g/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 291 vs. $2(128) = 256$.
time = 0.38, size = 291, normalized size = 2.06

$$\frac{2\left(\left(-2i\,A^2+2i\,AB-i\,B^2\right)b^2cd+\left(2i\,A^2-2i\,AB+i\,B^2\right)abd^2\right)gx+2\left(i\,B^2b^2d^2gx^2+2i\,B^2abd^2gx+i\,B^2a^2d^2g\right)\log\left(\frac{(bx+a)e}{dx+c}\right)^2-\left(\left(2i\,A^2-2i\,AB+i\,B^2\right)b^2c^2+\left(-2i\,A^2+2i\,AB-i\,B^2\right)a^2d^2\right)g+2\left(\left(2i\,AB-i\,B^2\right)b^2d^2gx^2+2\left(2i\,AB-i\,B^2\right)abd^2gx+\left(2i\,AB-i\,B^2\right)a^2d^2g\right)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4\left(bc^3d^2-ac^2d^3+\left(bcd^4-ad^5\right)x^2+2\left(bc^2d^3-acd^4\right)x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] 1/4*(2*((-2*I*A^2 + 2*I*A*B - I*B^2)*b^2*c*d + (2*I*A^2 - 2*I*A*B + I*B^2)*
a*b*d^2)*g*x + 2*(I*B^2*b^2*d^2*g*x^2 + 2*I*B^2*a*b*d^2*g*x + I*B^2*a^2*d^2
*g)*log((b*x + a)*e/(d*x + c))^2 - ((2*I*A^2 - 2*I*A*B + I*B^2)*b^2*c^2 + (
-2*I*A^2 + 2*I*A*B - I*B^2)*a^2*d^2)*g + 2*((2*I*A*B - I*B^2)*b^2*d^2*g*x^2
 + 2*(2*I*A*B - I*B^2)*a*b*d^2*g*x + (2*I*A*B - I*B^2)*a^2*d^2*g)*log((b*x
+ a)*e/(d*x + c)))/(b*c^3*d^2 - a*c^2*d^3 + (b*c*d^4 - a*d^5)*x^2 + 2*(b*c^
2*d^3 - a*c*d^4)*x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 712 vs. $2(121) = 242$.

time = 7.39, size = 712, normalized size = 5.05

$$\frac{Bb^2g(2A-B)\log\left(x+\frac{2ABab^2dg+2ABb^3cg-B^2ab^2dg-B^2b^3cg-\frac{Ba^2b^2d^2g(2A-B)}{ad-bc}+\frac{2Bab^3cdg(2A-B)}{ad-bc}-\frac{Bb^4c^2g(2A-B)}{ad-bc}}{4ABb^3dg-2B^2b^3dg}\right)}{2d^2i^3(ad-bc)}-\frac{Bb^2g(2A-B)\log\left(x+\frac{2ABab^2dg+2ABb^3cg-B^2ab^2dg-B^2b^3cg+\frac{Ba^2b^2d^2g(2A-B)}{ad-bc}-\frac{2Bab^3cdg(2A-B)}{ad-bc}+\frac{Bb^4c^2g(2A-B)}{ad-bc}}{4ABb^3dg-2B^2b^3dg}\right)}{2d^2i^3(ad-bc)}+\frac{(-B^2a^2g-2B^2abgx-B^2b^2gx^2)\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2ac^2di^3+4acd^2i^3x+2ad^3i^3x^2-2bc^3i^3-4bc^2di^3x-2bcd^2i^3x^2}+\frac{-2A^2adg-2A^2bcg+2ABadg+2ABbcg-B^2adg-B^2bcg+x(-4A^2bdg+4ABbdg-2B^2bdg)}{4c^2d^2i^3+8cd^3i^3x+4d^4i^3x^2}+\frac{(-2ABadg-2ABbcg-4ABbdgx+B^2adg+B^2bcg+2B^2bdgx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2c^2d^2i^3+4cd^3i^3x+2d^4i^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**3,x)
```

```
[Out] B*b**2*g*(2*A - B)*log(x + (2*A*B*a*b**2*d*g + 2*A*B*b**3*c*g - B**2*a*b**2
*d*g - B**2*b**3*c*g - B*a**2*b**2*d**2*g*(2*A - B)/(a*d - b*c) + 2*B*a*b**
3*c*d*g*(2*A - B)/(a*d - b*c) - B*b**4*c**2*g*(2*A - B)/(a*d - b*c))/(4*A*B
*b**3*d*g - 2*B**2*b**3*d*g))/(2*d**2*i**3*(a*d - b*c)) - B*b**2*g*(2*A - B
)*log(x + (2*A*B*a*b**2*d*g + 2*A*B*b**3*c*g - B**2*a*b**2*d*g - B**2*b**3*
c*g + B*a**2*b**2*d**2*g*(2*A - B)/(a*d - b*c) - 2*B*a*b**3*c*d*g*(2*A - B)
/(a*d - b*c) + B*b**4*c**2*g*(2*A - B)/(a*d - b*c))/(4*A*B*b**3*d*g - 2*B**
2*b**3*d*g))/(2*d**2*i**3*(a*d - b*c)) + (-B**2*a**2*g - 2*B**2*a*b*g*x - B
**2*b**2*g*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a*c**2*d*i**3 + 4*a*c*d**
2*i**3*x + 2*a*d**3*i**3*x**2 - 2*b*c**3*i**3 - 4*b*c**2*d*i**3*x - 2*b*c*d
**2*i**3*x**2) + (-2*A**2*a*d*g - 2*A**2*b*c*g + 2*A*B*a*d*g + 2*A*B*b*c*g
- B**2*a*d*g - B**2*b*c*g + x*(-4*A**2*b*d*g + 4*A*B*b*d*g - 2*B**2*b*d*g))
/(4*c**2*d**2*i**3 + 8*c*d**3*i**3*x + 4*d**4*i**3*x**2) + (-2*A*B*a*d*g -
2*A*B*b*c*g - 4*A*B*b*d*g*x + B**2*a*d*g + B**2*b*c*g + 2*B**2*b*d*g*x)*log
(e*(a + b*x)/(c + d*x))/(2*c**2*d**2*i**3 + 4*c*d**3*i**3*x + 2*d**4*i**3*x
**2)
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 268 vs. $2(128) = 256$.
time = 2.33, size = 268, normalized size = 1.90

$$\frac{1}{4}\left(\frac{2i\,(bxe+ae)^2B^2g\log\left(\frac{bxe+ae}{dx+c}\right)^2}{(dx+c)^2}+\frac{4i\,(bxe+ae)^2ABg\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}-\frac{2i\,(bxe+ae)^2B^2g\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+\frac{2i\,(bxe+ae)^2A^2g}{(dx+c)^2}-\frac{2i\,(bxe+ae)^2ABg}{(dx+c)^2}+\frac{i\,(bxe+ae)^2B^2g}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)e^{(-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] 1/4*(2*I*(b*x*e + a*e)^2*B^2*g*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^2 +
 4*I*(b*x*e + a*e)^2*A*B*g*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 2*I*(
b*x*e + a*e)^2*B^2*g*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 2*I*(b*x*e
+ a*e)^2*A^2*g/(d*x + c)^2 - 2*I*(b*x*e + a*e)^2*A*B*g/(d*x + c)^2 + I*(b*x
*e + a*e)^2*B^2*g/(d*x + c)^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b
*c*e - a*d*e)*(b*c - a*d)))*e^(-1)
```

Mupad [**B**]
time = 6.40, size = 474, normalized size = 3.36

$$-\frac{x\,(2\,b\,d\,g\,A^2-2\,b\,d\,g\,A\,B+b\,d\,g\,B^2)+A^2\,a\,d\,g+A^2\,b\,c\,g+\frac{B^2\,a\,d\,g}{2}+\frac{B^2\,b\,c\,g}{2}-A\,B\,a\,d\,g-A\,B\,b\,c\,g}{2\,c^2\,d^2\,i^3+4\,c\,d^3\,i^3\,x+2\,d^4\,i^3\,x^2}-\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2\left(\frac{\frac{B^2\,a\,g}{2\,d^2\,i^3}+\frac{B^2\,b\,c\,g}{2\,d^3\,i^3}+\frac{B^2\,b\,g\,x}{d^2\,i^3}}{2\,c\,x+d\,x^2+\frac{c^2}{d}}+\frac{B^2\,b^2\,g}{2\,d^2\,i^3\,(a\,d-b\,c)}\right)-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\left(\frac{A\,B\,c\,g}{d^3\,i^3}-x\left(\frac{B^2\,g}{d^2\,i^3}-\frac{2\,A\,B\,g}{d^2\,i^3}\right)+\frac{B\,g\,(A\,a\,d-B\,a\,d+B\,b\,c)}{b\,d^3\,i^3}+\frac{B^2\,b^2\,g\left(\frac{a^2\,d^2-3\,a\,b\,c\,d+2\,b^2\,c^2}{2\,b^3\,d}-\frac{c\,(a\,d-b\,c)}{2\,b^2\,d}\right)}{d^2\,i^3\,(a\,d-b\,c)}\right)}{\frac{d\,x^2}{b}+\frac{c^2}{b\,d}+\frac{2\,c\,x}{b}}+\frac{B\,b^2\,g\,\mathrm{atan}\left(\frac{\left(\frac{2\,a\,d^3\,i^3+2\,b\,c\,d^2\,i^3}{2\,d^2\,i^3}+2\,b\,d\,x\right)\,\mathrm{1i}}{a\,d-b\,c}\right)\,(2\,A-B)\,\mathrm{1i}}{d^2\,i^3\,(a\,d-b\,c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2)/(c*i + d*i*x)^3,
x)
```

```
[Out] (B*b^2*g*atan((((2*a*d^3*i^3 + 2*b*c*d^2*i^3)/(2*d^2*i^3) + 2*b*d*x)*1i)/(a
*d - b*c))*(2*A - B)*1i)/(d^2*i^3*(a*d - b*c)) - log((e*(a + b*x))/(c + d*x
))^2*(((B^2*a*g)/(2*d^2*i^3) + (B^2*b*c*g)/(2*d^3*i^3) + (B^2*b*g*x)/(d^2*i
^3))/(2*c*x + d*x^2 + c^2/d) + (B^2*b^2*g)/(2*d^2*i^3*(a*d - b*c))) - (log(
(e*(a + b*x))/(c + d*x))*((A*B*c*g)/(d^3*i^3) - x*((B^2*g)/(d^2*i^3) - (2*A
*B*g)/(d^2*i^3)) + (B*g*(A*a*d - B*a*d + B*b*c))/(b*d^3*i^3) + (B^2*b^2*g*(
(a^2*d^2 + 2*b^2*c^2 - 3*a*b*c*d)/(2*b^3*d) - (c*(a*d - b*c))/(2*b^2*d)))/(
d^2*i^3*(a*d - b*c))))/((d*x^2)/b + c^2/(b*d) + (2*c*x)/b) - (x*(2*A^2*b*d*
g + B^2*b*d*g - 2*A*B*b*d*g) + A^2*a*d*g + A^2*b*c*g + (B^2*a*d*g)/2 + (B^2
*b*c*g)/2 - A*B*a*d*g - A*B*b*c*g)/(2*c^2*d^2*i^3 + 2*d^4*i^3*x^2 + 4*c*d^3
*i^3*x)
```

3.103 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=296

$$-\frac{B^2d(a+bx)^2}{4(bc-ad)^2i^3(c+dx)^2}-\frac{2AbB(a+bx)}{(bc-ad)^2i^3(c+dx)}+\frac{2bB^2(a+bx)}{(bc-ad)^2i^3(c+dx)}-\frac{2bB^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(bc-ad)^2i^3(c+dx)}+\frac{Bd(a+}{2}$$

```
[Out] -1/4*B^2*d*(b*x+a)^2/(-a*d+b*c)^2/i^3/(d*x+c)^2-2*A*b*B*(b*x+a)/(-a*d+b*c)^
2/i^3/(d*x+c)+2*b*B^2*(b*x+a)/(-a*d+b*c)^2/i^3/(d*x+c)-2*b*B^2*(b*x+a)*ln(e
*(b*x+a)/(d*x+c))/(-a*d+b*c)^2/i^3/(d*x+c)+1/2*B*d*(b*x+a)^2*(A+B*ln(e*(b*x
+a)/(d*x+c)))/(-a*d+b*c)^2/i^3/(d*x+c)^2-1/2*d*(b*x+a)^2*(A+B*ln(e*(b*x+a)/
(d*x+c)))^2/(-a*d+b*c)^2/i^3/(d*x+c)^2+b*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c))
)^2/(-a*d+b*c)^2/i^3/(d*x+c)
```

Rubi [A]
time = 0.10, antiderivative size = 296, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {2552, 2367, 2333, 2332, 2342, 2341}

$$\frac{Bd(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2i^3(c+dx)^2(bc-ad)^2}+\frac{b(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{i^3(c+dx)(bc-ad)^2}-\frac{d(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2i^3(c+dx)^2(bc-ad)^2}-\frac{2AbB(a+bx)}{i^3(c+dx)(bc-ad)^2}-\frac{2bB^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{i^3(c+dx)(bc-ad)^2}+\frac{2bB^2(a+bx)}{i^3(c+dx)(bc-ad)^2}-\frac{B^2d(a+bx)^2}{4i^3(c+dx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x)^3,x]
```

```
[Out] -1/4*(B^2*d*(a + b*x)^2)/((b*c - a*d)^2*i^3*(c + d*x)^2) - (2*A*b*B*(a + b*
x))/((b*c - a*d)^2*i^3*(c + d*x)) + (2*b*B^2*(a + b*x))/((b*c - a*d)^2*i^3*
(c + d*x)) - (2*b*B^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^
2*i^3*(c + d*x)) + (B*d*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(
2*(b*c - a*d)^2*i^3*(c + d*x)^2) - (d*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/
(c + d*x)])^2)/(2*(b*c - a*d)^2*i^3*(c + d*x)^2) + (b*(a + b*x)*(A + B*Log[
(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^2*i^3*(c + d*x))
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2367

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2552

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(
m + 1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a
 + b*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && EqQ[n
 + mn, 0] && IGtQ[n, 0] && NeQ[b*c - a*d, 0] && IntegersQ[m, p] && EqQ[d*f
- c*g, 0] && (GtQ[p, 0] || LtQ[m, -1])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(103c+103dx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2}+\frac{B\int\frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{10609(a+bx)(c+dx)^3}dx}{103d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2}+\frac{(B(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)^3}dx}{1092727d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2}+\frac{(B(bc-ad))\int\left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^3(a+bx)}-\frac{d\left(A+B\log\ldots\right.}{(bc-ad\ldots}\right.}{\ldots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2}-\frac{B\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^3}dx}{1092727}-\frac{(b^2B)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right.}{c+dx}\ldots}{1092727(bc-ad)\ldots}$$

$$= \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d(c+dx)^2}+\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)(c+dx)}+\frac{b^2B\log(a+bx)\left(\ldots\right.}{109272\ldots}$$

$$= \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d(c+dx)^2}+\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)(c+dx)}+\frac{b^2B\log(a+bx)\left(\ldots\right.}{109272\ldots}$$

$$= \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d(c+dx)^2}+\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)(c+dx)}+\frac{b^2B\log(a+bx)\left(\ldots\right.}{109272\ldots}$$

$$= -\frac{B^2}{4370908d(c+dx)^2}-\frac{3bB^2}{2185454d(bc-ad)(c+dx)}-\frac{3b^2B^2\log(a+bx)}{2185454d(bc-ad)^2}\ldots$$

$$= -\frac{B^2}{4370908d(c+dx)^2}-\frac{3bB^2}{2185454d(bc-ad)(c+dx)}-\frac{3b^2B^2\log(a+bx)}{2185454d(bc-ad)^2}\ldots$$

$$= -\frac{B^2}{4370908d(c+dx)^2}-\frac{3bB^2}{2185454d(bc-ad)(c+dx)}-\frac{3b^2B^2\log(a+bx)}{2185454d(bc-ad)^2}\ldots$$

$$= -\frac{B^2}{4370908d(c+dx)^2}-\frac{3bB^2}{2185454d(bc-ad)(c+dx)}-\frac{3b^2B^2\log(a+bx)}{2185454d(bc-ad)^2}\ldots$$

<u>Mathematica</u> [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.27, size = 444, normalized size = 1.50

$$\frac{-2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{B\left(2(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+4b(bc-ad)(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+4b^2(c+dx)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)-4b^2(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)-4bB(c+dx)(bc-ad+b(c+dx)\log(a+bx)-b(c+dx)\log(c+dx))-B\left((bc-ad)^2+2b(bc-ad)(c+dx)+2b^2(c+dx)^2\log(a+bx)-2b^2(c+dx)^2\log(c+dx)\right)-2b^2B(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+2b^2B(c+dx)^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{(bc-ad)^2}}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x)^3,x]
```

```
[Out] (-2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*(b*c - a*d)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]) + 4*b*(b*c - a*d)*(c + d*x)*(A + B*Log[(e*(a + b
*x))/(c + d*x)]) + 4*b^2*(c + d*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/
(c + d*x)]) - 4*b^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
+ d*x] - 4*b*B*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x
)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c +
 d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]) - 2*b^2*B*(c + d*x)^
2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyL
og[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*(c + d*x)^2*((2*Log[(d*(a +
b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^2)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 687 vs. $2(290) = 580$.
time = 0.62, size = 688, normalized size = 2.32 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-d^2/(a*d-b*c)^3/e^2/i^3*A^2*b*(b*e/d+(a*d-b*c)*e/d/(d*
x+c))+1/2*d^3/(a*d-b*c)^3/e^3/i^3*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*d^2
/(a*d-b*c)^3/e^2/i^3*A*B*b*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/d)+2*d^3/(a*d-b*c)^3/e^3/i^3*A*B*(
1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*
e/d+(a*d-b*c)*e/d/(d*x+c))^2)-d^2/(a*d-b*c)^3/e^2/i^3*B^2*b*((b*e/d+(a*d-b*
c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*c)*e/d/(d*x+c)+2*b*e/d)+d^3
/(a*d-b*c)^3/e^3/i^3*B^2*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))^2-1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))+1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 795 vs. $2(274) = 548$.
time = 0.36, size = 795, normalized size = 2.69

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algorithm="maxima
")
```

```
[Out] -2*(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*lo
g(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c
 - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*
b*c^2*d^2 - I*a*c*d^3)*x) - log(b*x*e/(d*x + c) + a*e/(d*x + c))/(2*I*d^3*x
```

```
^2 + 4*I*c*d^2*x + 2*I*c^2*d))*A*B - 1/4*(8*(b^2*log(b*x + a)/(2*I*b^2*c^2*
d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*
b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*
d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*c^2*d^2 - I*a*c*d^3)*x))*log(b*x
*e/(d*x + c) + a*e/(d*x + c)) + (7*I*b^2*c^2 - 8*I*a*b*c*d + I*a^2*d^2 - 2*
(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a)^2 - 2*(-I*b^2*d^2
*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(d*x + c)^2 - 6*(-I*b^2*c*d + I*a*b*d^
2)*x - 6*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a) - 2*(3*I
*b^2*d^2*x^2 + 6*I*b^2*c*d*x + 3*I*b^2*c^2 + 2*(I*b^2*d^2*x^2 + 2*I*b^2*c*d
*x + I*b^2*c^2)*log(b*x + a))*log(d*x + c))/(b^2*c^4*d - 2*a*b*c^3*d^2 + a^
2*c^2*d^3 + (b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*x^2 + 2*(b^2*c^3*d^2 - 2*
a*b*c^2*d^3 + a^2*c*d^4)*x))*B^2 + B^2*log(b*x*e/(d*x + c) + a*e/(d*x + c))
^2/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + A^2/(2*I*d^3*x^2 + 4*I*c*d^2*x
 + 2*I*c^2*d)
```

Fricas [**A**]
time = 0.39, size = 366, normalized size = 1.24

$$\frac{(-2i\,A^2+6i\,AB-7i\,B^2)b^2c^2-4\,(-i\,A^2+2i\,AB-2i\,B^2)abcd+(-2i\,A^2+2i\,AB-i\,B^2)a^2d^2-2\,(-i\,B^2b^2d^2x^2-2i\,B^2b^2cdx-2i\,B^2abcd+i\,B^2a^2d^2)\log\left(\frac{(bx+a)e}{dx+c}\right)^2-2\,((-2i\,AB+3i\,B^2)b^2cd+(2i\,AB-3i\,B^2)abd^2)x-2\,((-2i\,AB+3i\,B^2)b^2d^2x^2+4\,(-i\,AB+i\,B^2)abcd+(2i\,AB-i\,B^2)a^2d^2+2\,(i\,B^2abd^2+2\,(-i\,AB+i\,B^2)b^2cd)x)\log\left(\frac{(bx+a)e}{dx+c}\right)}{4\,(b^2c^4d-2\,abc^3d^2+a^2c^2d^3+(b^2c^2d^3-2\,abcd^4+a^2d^5)x^2+2\,(b^2c^3d^2-2\,abc^2d^3+a^2cd^4)x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algorithm="fricas
")
```

```
[Out] 1/4*((-2*I*A^2 + 6*I*A*B - 7*I*B^2)*b^2*c^2 - 4*(-I*A^2 + 2*I*A*B - 2*I*B^2
)*a*b*c*d + (-2*I*A^2 + 2*I*A*B - I*B^2)*a^2*d^2 - 2*(-I*B^2*b^2*d^2*x^2 -
2*I*B^2*b^2*c*d*x - 2*I*B^2*a*b*c*d + I*B^2*a^2*d^2)*log((b*x + a)*e/(d*x +
 c))^2 - 2*((-2*I*A*B + 3*I*B^2)*b^2*c*d + (2*I*A*B - 3*I*B^2)*a*b*d^2)*x -
 2*((-2*I*A*B + 3*I*B^2)*b^2*d^2*x^2 + 4*(-I*A*B + I*B^2)*a*b*c*d + (2*I*A*
B - I*B^2)*a^2*d^2 + 2*(I*B^2*a*b*d^2 + 2*(-I*A*B + I*B^2)*b^2*c*d)*x)*log(
(b*x + a)*e/(d*x + c)))/(b^2*c^4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3 + (b^2*c^2
*d^3 - 2*a*b*c*d^4 + a^2*d^5)*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*
d^4)*x)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 892 vs. $2(269) = 538$.
time = 2.83, size = 892, normalized size = 3.01

$$-\frac{Bb^2\cdot(2A-3B)\log\left(x+\frac{2ABab^2d+2ABb^3c-3B^2ab^2d-3B^2b^3c-\frac{Ba^3b^2d^3\cdot(2A-3B)}{(ad-bc)^2}+\frac{3Ba^2b^3cd^2\cdot(2A-3B)}{(ad-bc)^2}-\frac{3Bab^4c^2d(2A-3B)}{(ad-bc)^2}+\frac{Bb^5c^3\cdot(2A-3B)}{(ad-bc)^2}}{4ABb^3d-6B^2b^3d}\right)}{2di^3\,(ad-bc)^2}+\frac{Bb^2\cdot(2A-3B)\log\left(x+\frac{2ABab^2d+2ABb^3c-3B^2ab^2d-3B^2b^3c+\frac{Ba^3b^2d^3\cdot(2A-3B)}{(ad-bc)^2}-\frac{3Ba^2b^3cd^2\cdot(2A-3B)}{(ad-bc)^2}+\frac{3Bab^4c^2d(2A-3B)}{(ad-bc)^2}-\frac{Bb^5c^3\cdot(2A-3B)}{(ad-bc)^2}}{4ABb^3d-6B^2b^3d}\right)}{2di^3\,(ad-bc)^2}+\frac{(-B^2a^2d+2B^2abc+2B^2b^2cx+B^2b^2dx^2)\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2a^2c^2d^2i^3+4a^2cd^3i^3x+2a^2d^4i^3x^2-4abc^3di^3-8abc^2d^2i^3x-4abcd^3i^3x^2+2b^2c^4i^3+4b^2c^3di^3x+2b^2c^2d^2i^3x^2}+\frac{(-2ABad+2ABbc+B^2ad-3B^2bc-2B^2bdx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2ac^2d^2i^3+4acd^3i^3x+2ad^4i^3x^2-2bc^3di^3-4bc^2d^2i^3x-2bcd^3i^3x^2}+\frac{-2A^2ad+2A^2bc+2ABad-6ABbc-B^2ad+7B^2bc+x(-4ABbd+6B^2bd)}{4ac^2d^2i^3-4bc^3di^3+x^2\cdot(4ad^4i^3-4bcd^3i^3)+x\,(8acd^3i^3-8bc^2d^2i^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**3,x)
```

```
[Out] -B*b**2*(2*A - 3*B)*log(x + (2*A*B*a*b**2*d + 2*A*B*b**3*c - 3*B**2*a*b**2*
d - 3*B**2*b**3*c - B*a**3*b**2*d**3*(2*A - 3*B)/(a*d - b*c)**2 + 3*B*a**2*
b**3*c*d**2*(2*A - 3*B)/(a*d - b*c)**2 - 3*B*a*b**4*c**2*d*(2*A - 3*B)/(a*d
```

```
 - b*c)**2 + B*b**5*c**3*(2*A - 3*B)/(a*d - b*c)**2)/(4*A*B*b**3*d - 6*B**2
*b**3*d))/(2*d*i**3*(a*d - b*c)**2) + B*b**2*(2*A - 3*B)*log(x + (2*A*B*a*b
**2*d + 2*A*B*b**3*c - 3*B**2*a*b**2*d - 3*B**2*b**3*c + B*a**3*b**2*d**3*(
2*A - 3*B)/(a*d - b*c)**2 - 3*B*a**2*b**3*c*d**2*(2*A - 3*B)/(a*d - b*c)**2
 + 3*B*a*b**4*c**2*d*(2*A - 3*B)/(a*d - b*c)**2 - B*b**5*c**3*(2*A - 3*B)/(
a*d - b*c)**2)/(4*A*B*b**3*d - 6*B**2*b**3*d))/(2*d*i**3*(a*d - b*c)**2) +
(-B**2*a**2*d + 2*B**2*a*b*c + 2*B**2*b**2*c*x + B**2*b**2*d*x**2)*log(e*(a
 + b*x)/(c + d*x))**2/(2*a**2*c**2*d**2*i**3 + 4*a**2*c*d**3*i**3*x + 2*a**
2*d**4*i**3*x**2 - 4*a*b*c**3*d*i**3 - 8*a*b*c**2*d**2*i**3*x - 4*a*b*c*d**
3*i**3*x**2 + 2*b**2*c**4*i**3 + 4*b**2*c**3*d*i**3*x + 2*b**2*c**2*d**2*i*
*3*x**2) + (-2*A*B*a*d + 2*A*B*b*c + B**2*a*d - 3*B**2*b*c - 2*B**2*b*d*x)*
log(e*(a + b*x)/(c + d*x))/(2*a*c**2*d**2*i**3 + 4*a*c*d**3*i**3*x + 2*a*d*
*4*i**3*x**2 - 2*b*c**3*d*i**3 - 4*b*c**2*d**2*i**3*x - 2*b*c*d**3*i**3*x**
2) + (-2*A**2*a*d + 2*A**2*b*c + 2*A*B*a*d - 6*A*B*b*c - B**2*a*d + 7*B**2*
b*c + x*(-4*A*B*b*d + 6*B**2*b*d))/(4*a*c**2*d**2*i**3 - 4*b*c**3*d*i**3 +
x**2*(4*a*d**4*i**3 - 4*b*c*d**3*i**3) + x*(8*a*c*d**3*i**3 - 8*b*c**2*d**2
*i**3))
```

Giac [A]
time = 2.75, size = 487, normalized size = 1.65

$$-\frac{\left(-\frac{4i\,(bxe+ae)B^2be\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}-\frac{8i\,(bxe+ae)ABbe\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{8i\,(bxe+ae)B^2be\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{2i\,(bxe+ae)^2B^2d\log\left(\frac{bxe+ae}{dx+c}\right)^2}{(dx+c)^2}-\frac{4i\,(bxe+ae)A^2be}{dx+c}+\frac{8i\,(bxe+ae)ABbe}{dx+c}-\frac{8i\,(bxe+ae)B^2be}{dx+c}+\frac{4i\,(bxe+ae)^2ABd\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}-\frac{2i\,(bxe+ae)^2B^2d\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+\frac{2i\,(bxe+ae)^2A^2d}{(dx+c)^2}-\frac{2i\,(bxe+ae)^2ABd}{(dx+c)^2}+\frac{i\,(bxe+ae)^2B^2d}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{4\,(bce-ade)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] -1/4*(-4*I*(b*x*e + a*e)*B^2*b*e*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) -
 8*I*(b*x*e + a*e)*A*B*b*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 8*I*(b*
x*e + a*e)*B^2*b*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 2*I*(b*x*e + a*
e)^2*B^2*d*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^2 - 4*I*(b*x*e + a*e)*A
^2*b*e/(d*x + c) + 8*I*(b*x*e + a*e)*A*B*b*e/(d*x + c) - 8*I*(b*x*e + a*e)*
B^2*b*e/(d*x + c) + 4*I*(b*x*e + a*e)^2*A*B*d*log((b*x*e + a*e)/(d*x + c))/
(d*x + c)^2 - 2*I*(b*x*e + a*e)^2*B^2*d*log((b*x*e + a*e)/(d*x + c))/(d*x +
 c)^2 + 2*I*(b*x*e + a*e)^2*A^2*d/(d*x + c)^2 - 2*I*(b*x*e + a*e)^2*A*B*d/(
d*x + c)^2 + I*(b*x*e + a*e)^2*B^2*d/(d*x + c)^2)*(b*c/((b*c*e - a*d*e)*(b*
c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b*c*e - a*d*e)
```

Mupad [B]
time = 6.48, size = 507, normalized size = 1.71

$$-\frac{\frac{2\,A^2\,a\,d-2\,A^2\,b\,c+B^2\,a\,d-7\,B^2\,b\,c-2\,A\,B\,a\,d+6\,A\,B\,b\,c}{2\,(a\,d-b\,c)}-\frac{x\,(3\,B^2\,b\,d-2\,A\,B\,b\,d)}{a\,d-b\,c}}{2\,c^2\,d\,i^3+4\,c\,d^2\,i^3\,x+2\,d^3\,i^3\,x^2}-\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2\left(\frac{B^2}{2\,d^2\,i^3\,\left(2\,c\,x+d\,x^2+\frac{c^2}{d}\right)}-\frac{B^2\,b^2}{2\,d\,i^3\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\,\left(\frac{A\,B}{b\,d^2\,i^3}+\frac{B^2\,x\,(a\,d-b\,c)}{d\,i^3\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}-\frac{B^2\,b^2\,\left(\frac{a^2\,d^2-3\,a\,b\,c\,d+2\,b^2\,c^2}{2\,b^3\,d}-\frac{c\,(a\,d-b\,c)}{2\,b^2\,d}\right)}{d\,i^3\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}\right)}{\frac{d\,x^2}{b}+\frac{c^2}{b\,d}+\frac{2\,c\,x}{b}}+\frac{B\,b^2\,\mathrm{atan}\left(\frac{B\,b^2\,\left(2\,b\,d\,x+\frac{a^2\,d^3\,i^3-b^2\,c^2\,d\,i^3}{d\,i^3\,(a\,d-b\,c)}\right)\,(2\,A-3\,B)\,1{}\mathrm{i}}{(a\,d-b\,c)\,(3\,B^2\,b^2-2\,A\,B\,b^2)}\right)\,(2\,A-3\,B)\,1{}\mathrm{i}}{d\,i^3\,{(a\,d-b\,c)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(c*i + d*i*x)^3,x)
```

```
[Out] (B*b^2*atan((B*b^2*(2*b*d*x + (a^2*d^3*i^3 - b^2*c^2*d*i^3)/(d*i^3*(a*d - b
*c)))*(2*A - 3*B)*1i)/((a*d - b*c)*(3*B^2*b^2 - 2*A*B*b^2)))*(2*A - 3*B)*1i
)/(d*i^3*(a*d - b*c)^2) - log((e*(a + b*x))/(c + d*x))^2*(B^2/(2*d^2*i^3*(2
*c*x + d*x^2 + c^2/d)) - (B^2*b^2)/(2*d*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)
)) - (log((e*(a + b*x))/(c + d*x))*((A*B)/(b*d^2*i^3) + (B^2*x*(a*d - b*c))
/(d*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (B^2*b^2*((a^2*d^2 + 2*b^2*c^2 -
 3*a*b*c*d)/(2*b^3*d) - (c*(a*d - b*c))/(2*b^2*d)))/(d*i^3*(a^2*d^2 + b^2*c
^2 - 2*a*b*c*d))))/((d*x^2)/b + c^2/(b*d) + (2*c*x)/b) - ((2*A^2*a*d - 2*A^
2*b*c + B^2*a*d - 7*B^2*b*c - 2*A*B*a*d + 6*A*B*b*c)/(2*(a*d - b*c)) - (x*(
3*B^2*b*d - 2*A*B*b*d))/(a*d - b*c))/(2*c^2*d*i^3 + 2*d^3*i^3*x^2 + 4*c*d^2
*i^3*x)
```

3.104 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)^3}\,dx$

Optimal. Leaf size=375

$$\frac{B^2d^2(a+bx)^2}{4(bc-ad)^3gi^3(c+dx)^2}+\frac{4AbBd(a+bx)}{(bc-ad)^3gi^3(c+dx)}-\frac{4bB^2d(a+bx)}{(bc-ad)^3gi^3(c+dx)}+\frac{4bB^2d(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(bc-ad)^3gi^3(c+dx)}-\frac{Bd}{}$$

```
[Out] 1/4*B^2*d^2*(b*x+a)^2/(-a*d+b*c)^3/g/i^3/(d*x+c)^2+4*A*b*B*d*(b*x+a)/(-a*d+
b*c)^3/g/i^3/(d*x+c)-4*b*B^2*d*(b*x+a)/(-a*d+b*c)^3/g/i^3/(d*x+c)+4*b*B^2*d
*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/(-a*d+b*c)^3/g/i^3/(d*x+c)-1/2*B*d^2*(b*x+a)
^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g/i^3/(d*x+c)^2+1/2*d^2*(b*x+a)
^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3/g/i^3/(d*x+c)^2-2*b*d*(b*x+a)
*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3/g/i^3/(d*x+c)+1/3*b^2*(A+B*ln(e
*(b*x+a)/(d*x+c)))^3/B/(-a*d+b*c)^3/g/i^3
```

Rubi [A]

time = 0.28, antiderivative size = 375, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {2562, 2388, 2339, 30, 2333, 2332, 2367, 2342, 2341}

$$\frac{b^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bgi^3(bc-ad)^3}+\frac{d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{Bd^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{2bd(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{gi^3(c+dx)(bc-ad)^3}+\frac{4AbBd(a+bx)}{gi^3(c+dx)(bc-ad)^3}+\frac{B^2d^2(a+bx)^2}{4gi^3(c+dx)^2(bc-ad)^3}+\frac{4bB^2d(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{gi^3(c+dx)(bc-ad)^3}-\frac{4bB^2d(a+bx)}{gi^3(c+dx)(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*x)^3),
x]
```

```
[Out] (B^2*d^2*(a + b*x)^2)/(4*(b*c - a*d)^3*g*i^3*(c + d*x)^2) + (4*A*b*B*d*(a +
 b*x))/((b*c - a*d)^3*g*i^3*(c + d*x)) - (4*b*B^2*d*(a + b*x))/((b*c - a*d)
^3*g*i^3*(c + d*x)) + (4*b*B^2*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((
b*c - a*d)^3*g*i^3*(c + d*x)) - (B*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) + (d^2*(a + b*x)^2*(A + B
*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) - (2*
b*d*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g*i^3*
(c + d*x)) + (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^
3*g*i^3)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2367

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2388

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[(d + e*x)^(q - 1)*((a + b*Log[c*x^n])^p/x),
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
```

```
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(104c+104dx)^3(ag+bgx)}\,dx = \int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^3g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)g(c+dx)^3} - \frac{bd(}{1124}\right.$$

$$= \frac{b^3\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{1124864(bc-ad)^3g} - \frac{(b^2d)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{1124864(bc-ad)^3g} - \frac{(bd)\int\frac{(A+B}{}}{11248646}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+}{}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2249728(bc-ad)g(c+dx)^2} - \frac{3bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1124864(bc-ad)^2g(c+dx)} - \frac{3b^2B\,\mathrm{lo}}{}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2249728(bc-ad)g(c+dx)^2} - \frac{3bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1124864(bc-ad)^2g(c+dx)} - \frac{3b^2B\,\mathrm{lo}}{}$$

$$= -\frac{b^2B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{1124864(bc-ad)^3g} - \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2249728(bc-ad)g(c+dx)^2} - \frac{3bB}{1124}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\,\mathrm{lo}}{2249728(}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\,\mathrm{lo}}{2249728(}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\,\mathrm{lo}}{2249728(}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\,\mathrm{lo}}{2249728(}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\,\mathrm{lo}}{2249728(}$$

Mathematica [A]
time = 0.62, size = 290, normalized size = 0.77

$$\frac{\frac{3(2A^2-2AB+B^2)(bc-ad)^2}{(c+dx)^2}+\frac{6b(2A^2-6AB+7B^2)(bc-ad)}{c+dx}+6b^2(2A^2-6AB+7B^2)\log(a+bx)+\frac{6B(bc-ad)(B(-7bc+ad-6bdx)+A(6bc-2ad+4bdx))\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}+\frac{6B\left(2Ab^2(c+dx)^2+Bd(a+bx)(-4bc+ad-3bdx)\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}+4b^2B^2\log^3\left(\frac{e(a+bx)}{c+dx}\right)-6b^2(2A^2-6AB+7B^2)\log(c+dx)}{12(bc-ad)^3gi^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*
x)^3),x]
```

```
[Out] ((3*(2*A^2 - 2*A*B + B^2)*(b*c - a*d)^2)/(c + d*x)^2 + (6*b*(2*A^2 - 6*A*B
+ 7*B^2)*(b*c - a*d))/(c + d*x) + 6*b^2*(2*A^2 - 6*A*B + 7*B^2)*Log[a + b*x
] + (6*B*(b*c - a*d)*(B*(-7*b*c + a*d - 6*b*d*x) + A*(6*b*c - 2*a*d + 4*b*d
*x))*Log[(e*(a + b*x))/(c + d*x)])/(c + d*x)^2 + (6*B*(2*A*b^2*(c + d*x)^2
+ B*d*(a + b*x)*(-4*b*c + a*d - 3*b*d*x))*Log[(e*(a + b*x))/(c + d*x)]^2)/(
c + d*x)^2 + 4*b^2*B^2*Log[(e*(a + b*x))/(c + d*x)]^3 - 6*b^2*(2*A^2 - 6*A*
B + 7*B^2)*Log[c + d*x])/(12*(b*c - a*d)^3*g*i^3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 880 vs. $2(367) = 734$.
time = 0.70, size = 881, normalized size = 2.35 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x,method=_RETUR
NVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(d^2/e/i^3/(a*d-b*c)^4/g*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-2*d^3/e^2/i^3/(a*d-b*c)^4/g*A^2*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/
2*d^4/e^3/i^3/(a*d-b*c)^4/g*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+d^2/e/i^3/(
a*d-b*c)^4/g*A*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-4*d^3/e^2/i^3/(a*d-b
*c)^4/g*A*B*b*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)-(a*d-b*c)*e/d/(d*x+c)-b*e/d)+2*d^4/e^3/i^3/(a*d-b*c)^4/g*A*B*(1/2*(b*e/d+
(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*e/d+(a*d-b*
c)*e/d/(d*x+c))^2)+1/3*d^2/e/i^3/(a*d-b*c)^4/g*B^2*b^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^3-2*d^3/e^2/i^3/(a*d-b*c)^4/g*B^2*b*((b*e/d+(a*d-b*c)*e/d/(d*x+
c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*c)*e/d/(d*x+c)+2*b*e/d)+d^4/e^3/i^3/(a*
d-b*c)^4/g*B^2*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2-1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))+1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2027 vs. $2(348) = 696$.
time = 0.64, size = 2027, normalized size = 5.41

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] 1/2*B^2*(2*b^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^
2 + I*a^3*d^3)*g) - 2*b^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I
*a^2*b*c*d^2 + I*a^3*d^3)*g) + (2*b*d*x + 3*b*c - a*d)/((-I*b^2*c^2*d^2 + 2
*I*a*b*c*d^3 - I*a^2*d^4)*g*x^2 + 2*(-I*b^2*c^3*d + 2*I*a*b*c^2*d^2 - I*a^2
*c*d^3)*g*x + (-I*b^2*c^4 + 2*I*a*b*c^3*d - I*a^2*c^2*d^2)*g))*log(b*x*e/(d
*x + c) + a*e/(d*x + c))^2 + A*B*(2*b^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b
^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) - 2*b^2*log(d*x + c)/((-I*b^3*c^
3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) + (2*b*d*x + 3*b*c -
a*d)/((-I*b^2*c^2*d^2 + 2*I*a*b*c*d^3 - I*a^2*d^4)*g*x^2 + 2*(-I*b^2*c^3*d
+ 2*I*a*b*c^2*d^2 - I*a^2*c*d^3)*g*x + (-I*b^2*c^4 + 2*I*a*b*c^3*d - I*a^2*
c^2*d^2)*g))*log(b*x*e/(d*x + c) + a*e/(d*x + c)) + 1/2*A^2*(2*b^2*log(b*x
+ a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) - 2*b
^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^
3)*g) + (2*b*d*x + 3*b*c - a*d)/((-I*b^2*c^2*d^2 + 2*I*a*b*c*d^3 - I*a^2*d^
4)*g*x^2 + 2*(-I*b^2*c^3*d + 2*I*a*b*c^2*d^2 - I*a^2*c*d^3)*g*x + (-I*b^2*c
^4 + 2*I*a*b*c^3*d - I*a^2*c^2*d^2)*g)) - 1/12*B^2*(6*(7*I*b^2*c^2 - 8*I*a*
b*c*d + I*a^2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x
+ a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(d*x + c)^2 - 6*
(-I*b^2*c*d + I*a*b*d^2)*x - 6*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)
*log(b*x + a) - 2*(3*I*b^2*d^2*x^2 + 6*I*b^2*c*d*x + 3*I*b^2*c^2 + 2*(I*b^2
*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)*log(b*x + a))*log(d*x + c))*log(b*x*e
/(d*x + c) + a*e/(d*x + c))/(b^3*c^5*g - 3*a*b^2*c^4*d*g + 3*a^2*b*c^3*d^2*
g - a^3*c^2*d^3*g + (b^3*c^3*d^2*g - 3*a*b^2*c^2*d^3*g + 3*a^2*b*c*d^4*g -
a^3*d^5*g)*x^2 + 2*(b^3*c^4*d*g - 3*a*b^2*c^3*d^2*g + 3*a^2*b*c^2*d^3*g - a
^3*c*d^4*g)*x) + (-45*I*b^2*c^2 + 48*I*a*b*c*d - 3*I*a^2*d^2 - 4*(I*b^2*d^2
*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)*log(b*x + a)^3 - 4*(-I*b^2*d^2*x^2 - 2*I*
b^2*c*d*x - I*b^2*c^2)*log(d*x + c)^3 - 18*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x +
 I*b^2*c^2)*log(b*x + a)^2 - 6*(3*I*b^2*d^2*x^2 + 6*I*b^2*c*d*x + 3*I*b^2*c
^2 + 2*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)*log(b*x + a))*log(d*x +
c)^2 - 42*(I*b^2*c*d - I*a*b*d^2)*x - 42*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I
*b^2*c^2)*log(b*x + a) - 6*(-7*I*b^2*d^2*x^2 - 14*I*b^2*c*d*x - 7*I*b^2*c^2
 + 2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a)^2 + 6*(-I*b^
2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a))*log(d*x + c))/(b^3*c^5
*g - 3*a*b^2*c^4*d*g + 3*a^2*b*c^3*d^2*g - a^3*c^2*d^3*g + (b^3*c^3*d^2*g -
 3*a*b^2*c^2*d^3*g + 3*a^2*b*c*d^4*g - a^3*d^5*g)*x^2 + 2*(b^3*c^4*d*g - 3*
a*b^2*c^3*d^2*g + 3*a^2*b*c^2*d^3*g - a^3*c*d^4*g)*x)) - 1/2*(7*I*b^2*c^2 -
 8*I*a*b*c*d + I*a^2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*l
og(b*x + a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(d*x + c)
^2 - 6*(-I*b^2*c*d + I*a*b*d^2)*x - 6*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b
^2*c^2)*log(b*x + a) - 2*(3*I*b^2*d^2*x^2 + 6*I*b^2*c*d*x + 3*I*b^2*c^2 + 2
*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)*log(b*x + a))*log(d*x + c))*A*
B/(b^3*c^5*g - 3*a*b^2*c^4*d*g + 3*a^2*b*c^3*d^2*g - a^3*c^2*d^3*g + (b^3*c
```

```
^3*d^2*g - 3*a*b^2*c^2*d^3*g + 3*a^2*b*c*d^4*g - a^3*d^5*g)*x^2 + 2*(b^3*c^
4*d*g - 3*a*b^2*c^3*d^2*g + 3*a^2*b*c^2*d^3*g - a^3*c*d^4*g)*x)
```

Fricas [A]
time = 0.42, size = 543, normalized size = 1.45

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] 1/12*(3*(6*I*A^2 - 14*I*A*B + 15*I*B^2)*b^2*c^2 + 24*(-I*A^2 + 2*I*A*B - 2*
I*B^2)*a*b*c*d + 3*(2*I*A^2 - 2*I*A*B + I*B^2)*a^2*d^2 + 4*(I*B^2*b^2*d^2*x
^2 + 2*I*B^2*b^2*c*d*x + I*B^2*b^2*c^2)*log((b*x + a)*e/(d*x + c))^3 + 6*((
2*I*A*B - 3*I*B^2)*b^2*d^2*x^2 + 2*I*A*B*b^2*c^2 - 4*I*B^2*a*b*c*d + I*B^2*
a^2*d^2 + 2*(-I*B^2*a*b*d^2 + 2*(I*A*B - I*B^2)*b^2*c*d)*x)*log((b*x + a)*e
/(d*x + c))^2 + 6*((2*I*A^2 - 6*I*A*B + 7*I*B^2)*b^2*c*d + (-2*I*A^2 + 6*I*
A*B - 7*I*B^2)*a*b*d^2)*x + 6*((2*I*A^2 - 6*I*A*B + 7*I*B^2)*b^2*d^2*x^2 +
2*I*A^2*b^2*c^2 + 8*(-I*A*B + I*B^2)*a*b*c*d + (2*I*A*B - I*B^2)*a^2*d^2 +
2*(2*(I*A^2 - 2*I*A*B + 2*I*B^2)*b^2*c*d + (-2*I*A*B + 3*I*B^2)*a*b*d^2)*x)
*log((b*x + a)*e/(d*x + c)))/((b^3*c^3*d^2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c*d^
4 - a^3*d^5)*g*x^2 + 2*(b^3*c^4*d - 3*a*b^2*c^3*d^2 + 3*a^2*b*c^2*d^3 - a^3
*c*d^4)*g*x + (b^3*c^5 - 3*a*b^2*c^4*d + 3*a^2*b*c^3*d^2 - a^3*c^2*d^3)*g)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 1488 vs. $2(333) = 666$.
time = 5.37, size = 1488, normalized size = 3.97

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)/(d*i*x+c*i)**3,x)
```

```
[Out] -B**2*b**2*log(e*(a + b*x)/(c + d*x))**3/(3*a**3*d**3*g*i**3 - 9*a**2*b*c*d
**2*g*i**3 + 9*a*b**2*c**2*d*g*i**3 - 3*b**3*c**3*g*i**3) + b**2*(2*A**2 -
6*A*B + 7*B**2)*log(x + (2*A**2*a*b**2*d + 2*A**2*b**3*c - 6*A*B*a*b**2*d -
 6*A*B*b**3*c + 7*B**2*a*b**2*d + 7*B**2*b**3*c - a**4*b**2*d**4*(2*A**2 -
6*A*B + 7*B**2)/(a*d - b*c)**3 + 4*a**3*b**3*c*d**3*(2*A**2 - 6*A*B + 7*B**
2)/(a*d - b*c)**3 - 6*a**2*b**4*c**2*d**2*(2*A**2 - 6*A*B + 7*B**2)/(a*d -
b*c)**3 + 4*a*b**5*c**3*d*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3 - b**6*c
**4*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b**3*d - 12*A*B*b**3*
d + 14*B**2*b**3*d))/(2*g*i**3*(a*d - b*c)**3) - b**2*(2*A**2 - 6*A*B + 7*B
**2)*log(x + (2*A**2*a*b**2*d + 2*A**2*b**3*c - 6*A*B*a*b**2*d - 6*A*B*b**3
*c + 7*B**2*a*b**2*d + 7*B**2*b**3*c + a**4*b**2*d**4*(2*A**2 - 6*A*B + 7*B
**2)/(a*d - b*c)**3 - 4*a**3*b**3*c*d**3*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b
```

```
*c)**3 + 6*a**2*b**4*c**2*d**2*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3 - 4
*a*b**5*c**3*d*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3 + b**6*c**4*(2*A**2
 - 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b**3*d - 12*A*B*b**3*d + 14*B**2
*b**3*d))/(2*g*i**3*(a*d - b*c)**3) + (-2*A*B*a*d + 6*A*B*b*c + 4*A*B*b*d*x
 + B**2*a*d - 7*B**2*b*c - 6*B**2*b*d*x)*log(e*(a + b*x)/(c + d*x))/(2*a**2
*c**2*d**2*g*i**3 + 4*a**2*c*d**3*g*i**3*x + 2*a**2*d**4*g*i**3*x**2 - 4*a*
b*c**3*d*g*i**3 - 8*a*b*c**2*d**2*g*i**3*x - 4*a*b*c*d**3*g*i**3*x**2 + 2*b
**2*c**4*g*i**3 + 4*b**2*c**3*d*g*i**3*x + 2*b**2*c**2*d**2*g*i**3*x**2) +
(-2*A*B*b**2*c**2 - 4*A*B*b**2*c*d*x - 2*A*B*b**2*d**2*x**2 - B**2*a**2*d**
2 + 4*B**2*a*b*c*d + 2*B**2*a*b*d**2*x + 4*B**2*b**2*c*d*x + 3*B**2*b**2*d*
*2*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*c**2*d**3*g*i**3 + 4*a**3*c*
d**4*g*i**3*x + 2*a**3*d**5*g*i**3*x**2 - 6*a**2*b*c**3*d**2*g*i**3 - 12*a*
*2*b*c**2*d**3*g*i**3*x - 6*a**2*b*c*d**4*g*i**3*x**2 + 6*a*b**2*c**4*d*g*i
**3 + 12*a*b**2*c**3*d**2*g*i**3*x + 6*a*b**2*c**2*d**3*g*i**3*x**2 - 2*b**
3*c**5*g*i**3 - 4*b**3*c**4*d*g*i**3*x - 2*b**3*c**3*d**2*g*i**3*x**2) + (-
2*A**2*a*d + 6*A**2*b*c + 2*A*B*a*d - 14*A*B*b*c - B**2*a*d + 15*B**2*b*c +
 x*(4*A**2*b*d - 12*A*B*b*d + 14*B**2*b*d))/(4*a**2*c**2*d**2*g*i**3 - 8*a*
b*c**3*d*g*i**3 + 4*b**2*c**4*g*i**3 + x**2*(4*a**2*d**4*g*i**3 - 8*a*b*c*d
**3*g*i**3 + 4*b**2*c**2*d**2*g*i**3) + x*(8*a**2*c*d**3*g*i**3 - 16*a*b*c*
*2*d**2*g*i**3 + 8*b**2*c**3*d*g*i**3))
```

Giac [A]

time = 3.12, size = 613, normalized size = 1.63

$$\frac{\left(4i\,B^2b^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)^3+12i\,ABb^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{24i\,(bxe+ae)B^2bde\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+12i\,A^2b^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{48i\,(bxe+ae)ABbde\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{48i\,(bxe+ae)B^2bde\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{6i\,(bxe+ae)^2B^2d^2\log\left(\frac{bxe+ae}{dx+c}\right)^2}{(dx+c)^2}-\frac{24i\,(bxe+ae)A^2bde}{dx+c}+\frac{48i\,(bxe+ae)ABbde}{dx+c}-\frac{48i\,(bxe+ae)B^2bde}{dx+c}+\frac{12i\,(bxe+ae)^2ABd^2\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}-\frac{6i\,(bxe+ae)^2B^2d^2\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+\frac{6i\,(bxe+ae)^2A^2d^2}{(dx+c)^2}-\frac{6i\,(bxe+ae)^2ABd^2}{(dx+c)^2}+\frac{3i\,(bxe+ae)^2B^2d^2}{(dx+c)^2}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{12\,(b^2c^2ge-2\,abcdge+a^2d^2ge)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] 1/12*(4*I*B^2*b^2*e^2*log((b*x*e + a*e)/(d*x + c))^3 + 12*I*A*B*b^2*e^2*log
((b*x*e + a*e)/(d*x + c))^2 - 24*I*(b*x*e + a*e)*B^2*b*d*e*log((b*x*e + a*e
)/(d*x + c))^2/(d*x + c) + 12*I*A^2*b^2*e^2*log((b*x*e + a*e)/(d*x + c)) -
48*I*(b*x*e + a*e)*A*B*b*d*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 48*I*
(b*x*e + a*e)*B^2*b*d*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 6*I*(b*x*e
 + a*e)^2*B^2*d^2*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^2 - 24*I*(b*x*e
+ a*e)*A^2*b*d*e/(d*x + c) + 48*I*(b*x*e + a*e)*A*B*b*d*e/(d*x + c) - 48*I*
(b*x*e + a*e)*B^2*b*d*e/(d*x + c) + 12*I*(b*x*e + a*e)^2*A*B*d^2*log((b*x*e
 + a*e)/(d*x + c))/(d*x + c)^2 - 6*I*(b*x*e + a*e)^2*B^2*d^2*log((b*x*e + a
*e)/(d*x + c))/(d*x + c)^2 + 6*I*(b*x*e + a*e)^2*A^2*d^2/(d*x + c)^2 - 6*I*
(b*x*e + a*e)^2*A*B*d^2/(d*x + c)^2 + 3*I*(b*x*e + a*e)^2*B^2*d^2/(d*x + c)
^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))
/(b^2*c^2*g*e - 2*a*b*c*d*g*e + a^2*d^2*g*e)
```

Mupad [B]

time = 8.10, size = 984, normalized size = 2.62

$$-\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^2\left(\frac{\frac{B^2\,b^2\,\left(\frac{a^2\,d^2-3\,a\,b\,c\,d+2\,b^2\,c^2}{2\,b^3\,d}-\frac{c\,(a\,d-b\,c)}{2\,b^2\,d}\right)}{g\,i^3\,(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3)}-\frac{B^2\,x\,(a\,d-b\,c)}{g\,i^3\,(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3)}}{\frac{d\,x^2}{b}+\frac{c^2}{b\,d}+\frac{2\,c\,x}{b}}+\frac{B\,b^2\,(2\,A-3\,B)}{2\,g\,i^3\,(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3)}\right)-\frac{\frac{2\,A^2\,a\,d-6\,A^2\,b\,c+B^2\,a\,d-15\,B^2\,b\,c-2\,A\,B\,a\,d+14\,A\,B\,b\,c}{2\,(a\,d-b\,c)}-\frac{x\,(2\,b\,d\,A^2-6\,b\,d\,A\,B+7\,b\,d\,B^2)}{a\,d-b\,c}}{x^2\,(2\,a\,d^3\,g\,i^3-2\,b\,c\,d^2\,g\,i^3)+x\,(4\,a\,c\,d^2\,g\,i^3-4\,b\,c^2\,d\,g\,i^3)-2\,b\,c^3\,g\,i^3+2\,a\,c^2\,d\,g\,i^3}-\frac{\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\left(\frac{B^2}{b\,d\,g\,i^3\,(a\,d-b\,c)}+\frac{B\,b^2\,\left(\frac{a^2\,d^2-3\,a\,b\,c\,d+2\,b^2\,c^2}{2\,b^3\,d}-\frac{c\,(a\,d-b\,c)}{2\,b^2\,d}\right)\,(2\,A-3\,B)}{g\,i^3\,(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3)}-\frac{B\,x\,(2\,A-3\,B)\,(a\,d-b\,c)}{g\,i^3\,(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3)}\right)}{\frac{d\,x^2}{b}+\frac{c^2}{b\,d}+\frac{2\,c\,x}{b}}-\frac{B^2\,b^2\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)^3}{3\,g\,i^3\,(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3)}+\frac{b^2\,\mathrm{atan}\left(\frac{b^2\,\left(A^2-3\,A\,B+\frac{7\,B^2}{2}\right)\,(2\,g\,a^3\,d^3\,i^3-2\,g\,a^2\,b\,c\,d^2\,i^3-2\,g\,a\,b^2\,c^2\,d\,i^3+2\,g\,b^3\,c^3\,i^3)\,1{}\mathrm{i}}{g\,i^3\,{(a\,d-b\,c)}^3\,(2\,A^2\,b^2-6\,A\,B\,b^2+7\,B^2\,b^2)}+\frac{b^3\,d\,x\,(g\,a^2\,d^2\,i^3-2\,g\,a\,b\,c\,d\,i^3+g\,b^2\,c^2\,i^3)\,\left(A^2-3\,A\,B+\frac{7\,B^2}{2}\right)\,4{}\mathrm{i}}{g\,i^3\,{(a\,d-b\,c)}^3\,(2\,A^2\,b^2-6\,A\,B\,b^2+7\,B^2\,b^2)}\right)\,\left(A^2-3\,A\,B+\frac{7\,B^2}{2}\right)\,2{}\mathrm{i}}{g\,i^3\,{(a\,d-b\,c)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)*(c*i + d*i*x)^3),
x)
```

```
[Out] (b^2*atan((b^2*(A^2 + (7*B^2)/2 - 3*A*B)*(2*a^3*d^3*g*i^3 + 2*b^3*c^3*g*i^3
 - 2*a*b^2*c^2*d*g*i^3 - 2*a^2*b*c*d^2*g*i^3)*1i)/(g*i^3*(a*d - b*c)^3*(2*A
^2*b^2 + 7*B^2*b^2 - 6*A*B*b^2)) + (b^3*d*x*(a^2*d^2*g*i^3 + b^2*c^2*g*i^3
- 2*a*b*c*d*g*i^3)*(A^2 + (7*B^2)/2 - 3*A*B)*4i)/(g*i^3*(a*d - b*c)^3*(2*A^
2*b^2 + 7*B^2*b^2 - 6*A*B*b^2)))*(A^2 + (7*B^2)/2 - 3*A*B)*2i)/(g*i^3*(a*d
- b*c)^3) - ((2*A^2*a*d - 6*A^2*b*c + B^2*a*d - 15*B^2*b*c - 2*A*B*a*d + 14
*A*B*b*c)/(2*(a*d - b*c)) - (x*(2*A^2*b*d + 7*B^2*b*d - 6*A*B*b*d))/(a*d -
b*c))/(x^2*(2*a*d^3*g*i^3 - 2*b*c*d^2*g*i^3) + x*(4*a*c*d^2*g*i^3 - 4*b*c^2
*d*g*i^3) - 2*b*c^3*g*i^3 + 2*a*c^2*d*g*i^3) - (log((e*(a + b*x))/(c + d*x)
)*(B^2/(b*d*g*i^3*(a*d - b*c)) + (B*b^2*((a^2*d^2 + 2*b^2*c^2 - 3*a*b*c*d)/
(2*b^3*d) - (c*(a*d - b*c))/(2*b^2*d))*(2*A - 3*B))/(g*i^3*(a^3*d^3 - b^3*c
^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (B*x*(2*A - 3*B)*(a*d - b*c))/(g*i^3
*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))))/((d*x^2)/b + c^2/(b
*d) + (2*c*x)/b) - log((e*(a + b*x))/(c + d*x))^2*(((B^2*b^2*((a^2*d^2 + 2*
b^2*c^2 - 3*a*b*c*d)/(2*b^3*d) - (c*(a*d - b*c))/(2*b^2*d)))/(g*i^3*(a^3*d^
3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (B^2*x*(a*d - b*c))/(g*i^3*
(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)))/((d*x^2)/b + c^2/(b*d
) + (2*c*x)/b) + (B*b^2*(2*A - 3*B))/(2*g*i^3*(a^3*d^3 - b^3*c^3 + 3*a*b^2*
c^2*d - 3*a^2*b*c*d^2))) - (B^2*b^2*log((e*(a + b*x))/(c + d*x))^3)/(3*g*i^
3*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))
```

3.105 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)^3}\,dx$

Optimal. Leaf size=525

$$-\frac{B^2d^3(a+bx)^2}{4(bc-ad)^4g^2i^3(c+dx)^2}-\frac{6AbBd^2(a+bx)}{(bc-ad)^4g^2i^3(c+dx)}+\frac{6bB^2d^2(a+bx)}{(bc-ad)^4g^2i^3(c+dx)}-\frac{2b^3B^2(c+dx)}{(bc-ad)^4g^2i^3(a+bx)}-\frac{6bB^2}{(b}$$

```
[Out] -1/4*B^2*d^3*(b*x+a)^2/(-a*d+b*c)^4/g^2/i^3/(d*x+c)^2-6*A*b*B*d^2*(b*x+a)/(
-a*d+b*c)^4/g^2/i^3/(d*x+c)+6*b*B^2*d^2*(b*x+a)/(-a*d+b*c)^4/g^2/i^3/(d*x+c
)-2*b^3*B^2*(d*x+c)/(-a*d+b*c)^4/g^2/i^3/(b*x+a)-6*b*B^2*d^2*(b*x+a)*ln(e*(
b*x+a)/(d*x+c))/(-a*d+b*c)^4/g^2/i^3/(d*x+c)+1/2*B*d^3*(b*x+a)^2*(A+B*ln(e*
(b*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^2/i^3/(d*x+c)^2-2*b^3*B*(d*x+c)*(A+B*ln(e*
(b*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^2/i^3/(b*x+a)-1/2*d^3*(b*x+a)^2*(A+B*ln(e*
(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^4/g^2/i^3/(d*x+c)^2+3*b*d^2*(b*x+a)*(A+B*ln(
e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^4/g^2/i^3/(d*x+c)-b^3*(d*x+c)*(A+B*ln(e*(b
*x+a)/(d*x+c)))^2/(-a*d+b*c)^4/g^2/i^3/(b*x+a)-b^2*d*(A+B*ln(e*(b*x+a)/(d*x
+c)))^3/B/(-a*d+b*c)^4/g^2/i^3
```

Rubi [A]
time = 0.29, antiderivative size = 525, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2562, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^3(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2i^3(a+bx)(bc-ad)^4}-\frac{2b^3B(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{b^2d\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{Bg^2i^3(bc-ad)^4}-\frac{d^3(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^2i^3(c+dx)^2(bc-ad)^4}+\frac{Bd^3(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^2i^3(c+dx)^2(bc-ad)^4}+\frac{3bd^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2i^3(c+dx)(bc-ad)^4}-\frac{6AbBd^2(a+bx)}{g^2i^3(c+dx)(bc-ad)^4}-\frac{2b^3B^2(c+dx)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{B^2d^3(a+bx)^2}{4g^2i^3(c+dx)^2(bc-ad)^4}-\frac{6bB^2d^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{g^2i^3(c+dx)(bc-ad)^4}+\frac{6bB^2d^2(a+bx)}{g^2i^3(c+dx)(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*i*x)^3
),x]
```

```
[Out] -1/4*(B^2*d^3*(a + b*x)^2)/((b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (6*A*b*B*d
^2*(a + b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) + (6*b*B^2*d^2*(a + b*x))/(
(b*c - a*d)^4*g^2*i^3*(c + d*x)) - (2*b^3*B^2*(c + d*x))/((b*c - a*d)^4*g^2
*i^3*(a + b*x)) - (6*b*B^2*d^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*
c - a*d)^4*g^2*i^3*(c + d*x)) + (B*d^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (2*b^3*B*(c + d*x)*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3*(a + b*x)) - (d^
3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^4*g^2*
i^3*(c + d*x)^2) + (3*b*d^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^
2)/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*(c + d*x)*(A + B*Log[(e*(a + b*
x))/(c + d*x)])^2)/((b*c - a*d)^4*g^2*i^3*(a + b*x)) - (b^2*d*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^3)/(B*(b*c - a*d)^4*g^2*i^3)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
```

```
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(105c+105dx)^3(ag+bgx)^2}\,dx = \int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)^2} - \frac{b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{385875(bc-ad)^4g^2(a+bx)} + \cdots\right.$$

$$= -\frac{(b^3d)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{385875(bc-ad)^4g^2} + \frac{(b^2d^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{385875(bc-ad)^4g^2} + \frac{b^3\int \cdots}{11\cdots}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{2b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1157625(bc-ad)^3g^2(a+bx)} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2315250(bc-ad)^2g^2(c+dx)^2} + \cdots$$

$$= -\frac{2b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1157625(bc-ad)^3g^2(a+bx)} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2315250(bc-ad)^2g^2(c+dx)^2} + \cdots$$

$$= \frac{b^2B^2d\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{385875(bc-ad)^4g^2} - \frac{2b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1157625(bc-ad)^3g^2(a+bx)} + \cdots$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \cdots$$

Mathematica [A]
time = 0.88, size = 453, normalized size = 0.86

$$-\frac{(2A^2-2AB+B^2)\,d(bc-ad)^2(a+bx)+2b(4A^2-10AB+11B^2)\,d(bc-ad)(a+bx)(c+dx)+4b^2(A^2+2AB+2B^2)\,(bc-ad)(c+dx)^2+6b^2(2A^2-2AB+5B^2)\,d(a+bx)(c+dx)^2\log(a+bx)+2B(bc-ad)\left((2A-B)d(bc-ad)(a+bx)+2b(4A-5B)d(a+bx)(c+dx)+4b^2(A+B)(c+dx)^2\right)\log\left(\frac{e(a+bx)}{c+dx}\right)+2B\left(a^3Bd^3-3a^2bBd^2(2c+dx)+3ab^2d\left(2A(c+dx)^2-Bdx(4c+3dx)\right)+b^3\left(6Adx(c+dx)^2+B(2c^3+6c^2dx-3d^3x^3)\right)\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)+4b^2B^2d(a+bx)(c+dx)^2\log^3\left(\frac{e(a+bx)}{c+dx}\right)-6b^2(2A^2-2AB+5B^2)\,d(a+bx)(c+dx)^2\log(c+dx)}{4(bc-ad)^4g^2i^3(a+bx)(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*
i*x)^3),x]
```

```
[Out] -1/4*((2*A^2 - 2*A*B + B^2)*d*(b*c - a*d)^2*(a + b*x) + 2*b*(4*A^2 - 10*A*B
 + 11*B^2)*d*(b*c - a*d)*(a + b*x)*(c + d*x) + 4*b^2*(A^2 + 2*A*B + 2*B^2)*
(b*c - a*d)*(c + d*x)^2 + 6*b^2*(2*A^2 - 2*A*B + 5*B^2)*d*(a + b*x)*(c + d*
x)^2*Log[a + b*x] + 2*B*(b*c - a*d)*((2*A - B)*d*(b*c - a*d)*(a + b*x) + 2*
b*(4*A - 5*B)*d*(a + b*x)*(c + d*x) + 4*b^2*(A + B)*(c + d*x)^2)*Log[(e*(a
+ b*x))/(c + d*x)] + 2*B*(a^3*B*d^3 - 3*a^2*b*B*d^2*(2*c + d*x) + 3*a*b^2*d
*(2*A*(c + d*x)^2 - B*d*x*(4*c + 3*d*x)) + b^3*(6*A*d*x*(c + d*x)^2 + B*(2*
c^3 + 6*c^2*d*x - 3*d^3*x^3)))*Log[(e*(a + b*x))/(c + d*x)]^2 + 4*b^2*B^2*d
*(a + b*x)*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]^3 - 6*b^2*(2*A^2 - 2*A*
B + 5*B^2)*d*(a + b*x)*(c + d*x)^2*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3*(a
+ b*x)*(c + d*x)^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1232 vs. 2(519) = 1038.
time = 0.81, size = 1233, normalized size = 2.35

method	result	size
derivativedivides	Expression too large to display	1233
default	Expression too large to display	1233
norman	Expression too large to display	1852
risch	Expression too large to display	2114

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(d^2/i^3/(a*d-b*c)^5/g^2*A^2*b^3/(b*e/d+(a*d-b*c)*e/d/(d
*x+c))+3*d^3/e/i^3/(a*d-b*c)^5/g^2*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
3*d^4/e^2/i^3/(a*d-b*c)^5/g^2*A^2*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/2*d^5/e
^3/i^3/(a*d-b*c)^5/g^2*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*d^2/i^3/(a*d-b
*c)^5/g^2*A*B*b^3*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))+3*d^3/e/i^3/(a*d-b*c)^5/g^2*A*B*b
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-6*d^4/e^2/i^3/(a*d-b*c)^5/g^2*A*B*b*((
b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/
(d*x+c)-b*e/d)+2*d^5/e^3/i^3/(a*d-b*c)^5/g^2*A*B*(1/2*(b*e/d+(a*d-b*c)*e/d/
```

```
(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^2)-d^2/i^3/(a*d-b*c)^5/g^2*B^2*b^3*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))+d^3/e/i^3/(a*d-b*c)^5/g
^2*B^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3-3*d^4/e^2/i^3/(a*d-b*c)^5/g^2*
B^2*b*((b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*c)*e/d
/(d*x+c)+2*b*e/d)+d^5/e^3/i^3/(a*d-b*c)^5/g^2*B^2*(1/2*(b*e/d+(a*d-b*c)*e/d
/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-1/2*(b*e/d+(a*d-b*c)*e/d/(d*x
+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)
)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 4045 vs. $2(493) = 986$.
time = 1.02, size = 4045, normalized size = 7.70

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] 1/2*B^2*(6*b^2*d*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c
^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) - 6*b^2*d*log(d*x + c)/((I*b^4*c
^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g
^2) + (6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b
*d^2)*x)/((I*b^4*c^3*d^2 - 3*I*a*b^3*c^2*d^3 + 3*I*a^2*b^2*c*d^4 - I*a^3*b*
d^5)*g^2*x^3 + (2*I*b^4*c^4*d - 5*I*a*b^3*c^3*d^2 + 3*I*a^2*b^2*c^2*d^3 + I
*a^3*b*c*d^4 - I*a^4*d^5)*g^2*x^2 + (I*b^4*c^5 - I*a*b^3*c^4*d - 3*I*a^2*b^
2*c^3*d^2 + 5*I*a^3*b*c^2*d^3 - 2*I*a^4*c*d^4)*g^2*x + (I*a*b^3*c^5 - 3*I*a
^2*b^2*c^4*d + 3*I*a^3*b*c^3*d^2 - I*a^4*c^2*d^3)*g^2))*log(b*x*e/(d*x + c)
 + a*e/(d*x + c))^2 + A*B*(6*b^2*d*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3
*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) - 6*b^2*d*log(
d*x + c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*
d^3 + I*a^4*d^4)*g^2) + (6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 +
3*(3*b^2*c*d + a*b*d^2)*x)/((I*b^4*c^3*d^2 - 3*I*a*b^3*c^2*d^3 + 3*I*a^2*b^
2*c*d^4 - I*a^3*b*d^5)*g^2*x^3 + (2*I*b^4*c^4*d - 5*I*a*b^3*c^3*d^2 + 3*I*a
^2*b^2*c^2*d^3 + I*a^3*b*c*d^4 - I*a^4*d^5)*g^2*x^2 + (I*b^4*c^5 - I*a*b^3*
c^4*d - 3*I*a^2*b^2*c^3*d^2 + 5*I*a^3*b*c^2*d^3 - 2*I*a^4*c*d^4)*g^2*x + (I
*a*b^3*c^5 - 3*I*a^2*b^2*c^4*d + 3*I*a^3*b*c^3*d^2 - I*a^4*c^2*d^3)*g^2))*l
og(b*x*e/(d*x + c) + a*e/(d*x + c)) + 1/2*A^2*(6*b^2*d*log(b*x + a)/((I*b^4
*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)
*g^2) - 6*b^2*d*log(d*x + c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^
2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) + (6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*
a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/((I*b^4*c^3*d^2 - 3*I*a*b^3*
```

```
c^2*d^3 + 3*I*a^2*b^2*c*d^4 - I*a^3*b*d^5)*g^2*x^3 + (2*I*b^4*c^4*d - 5*I*a
*b^3*c^3*d^2 + 3*I*a^2*b^2*c^2*d^3 + I*a^3*b*c*d^4 - I*a^4*d^5)*g^2*x^2 + (
I*b^4*c^5 - I*a*b^3*c^4*d - 3*I*a^2*b^2*c^3*d^2 + 5*I*a^3*b*c^2*d^3 - 2*I*a
^4*c*d^4)*g^2*x + (I*a*b^3*c^5 - 3*I*a^2*b^2*c^4*d + 3*I*a^3*b*c^3*d^2 - I*
a^4*c^2*d^3)*g^2)) + 1/4*B^2*(2*(-4*I*b^3*c^3 + 15*I*a*b^2*c^2*d - 12*I*a^2
*b*c*d^2 + I*a^3*d^3 - 6*(-I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 - 6*(-I*b^3*d^3*x
^3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2
*I*a*b^2*c*d^2)*x)*log(b*x + a)^2 - 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2
*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(d
*x + c)^2 - 3*(-I*b^3*c^2*d - 2*I*a*b^2*c*d^2 + 3*I*a^2*b*d^3)*x - 6*(-I*b^
3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^
2*d - 2*I*a*b^2*c*d^2)*x)*log(b*x + a) - 6*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d +
 (2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x + 2*
(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3
*c^2*d + 2*I*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c))*log(b*x*e/(d*x + c
) + a*e/(d*x + c))/(a*b^4*c^6*g^2 - 4*a^2*b^3*c^5*d*g^2 + 6*a^3*b^2*c^4*d^2
*g^2 - 4*a^4*b*c^3*d^3*g^2 + a^5*c^2*d^4*g^2 + (b^5*c^4*d^2*g^2 - 4*a*b^4*c
^3*d^3*g^2 + 6*a^2*b^3*c^2*d^4*g^2 - 4*a^3*b^2*c*d^5*g^2 + a^4*b*d^6*g^2)*x
^3 + (2*b^5*c^5*d*g^2 - 7*a*b^4*c^4*d^2*g^2 + 8*a^2*b^3*c^3*d^3*g^2 - 2*a^3
*b^2*c^2*d^4*g^2 - 2*a^4*b*c*d^5*g^2 + a^5*d^6*g^2)*x^2 + (b^5*c^6*g^2 - 2*
a*b^4*c^5*d*g^2 - 2*a^2*b^3*c^4*d^2*g^2 + 8*a^3*b^2*c^3*d^3*g^2 - 7*a^4*b*c
^2*d^4*g^2 + 2*a^5*c*d^5*g^2)*x) + (-8*I*b^3*c^3 - 15*I*a*b^2*c^2*d + 24*I*
a^2*b*c*d^2 - I*a^3*d^3 - 4*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2
 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x)*log(b*x + a)^3 - 4
*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I
*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(d*x + c)^3 - 30*(I*b^3*c*d^2 - I*a*b^2
*d^3)*x^2 - 6*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^2*d^3
)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x)*log(b*x + a)^2 - 6*(I*b^3*d^3*x^
3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*
a*b^2*c*d^2)*x + 2*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^
2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c)^
2 - 3*(13*I*b^3*c^2*d - 6*I*a*b^2*c*d^2 - 7*I*a^2*b*d^3)*x - 30*(I*b^3*d^3*
x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*
I*a*b^2*c*d^2)*x)*log(b*x + a) - 6*(-5*I*b^3*d^3*x^3 - 5*I*a*b^2*c^2*d + 5*
(-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + 2*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-
2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(
b*x + a)^2 + 5*(-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x + 2*(-I*b^3*d^3*x^3 - I*a
*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2
*c*d^2)*x)*log(b*x + a))*log(d*x + c))/(a*b^4*c^6*g^2 - 4*a^2*b^3*c^5*d*g^2
 + 6*a^3*b^2*c^4*d^2*g^2 - 4*a^4*b*c^3*d^3*g^2 + a^5*c^2*d^4*g^2 + (b^5*c^4
*d^2*g^2 - 4*a*b^4*c^3*d^3*g^2 + 6*a^2*b^3*c^2*d^4*g^2 - 4*a^3*b^2*c*d^5*g^
2 + a^4*b*d^6*g^2)*x^3 + (2*b^5*c^5*d*g^2 - 7*a*b^4*c^4*d^2*g^2 + 8*a^2*b^3
*c^3*d^3*g^2 - 2*a^3*b^2*c^2*d^4*g^2 - 2*a^4*b*c*d^5*g^2 + a^5*d^6*g^2)*x^2
 + (b^5*c^6*g^2 - 2*a*b^4*c^5*d*g^2 - 2*a^2*b^3...
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1017 vs. $2(493) = 986$.
time = 0.42, size = 1017, normalized size = 1.94

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] -1/4*(4*(I*A^2 + 2*I*A*B + 2*I*B^2)*b^3*c^3 + 3*(2*I*A^2 - 10*I*A*B + 5*I*B
^2)*a*b^2*c^2*d + 12*(-I*A^2 + 2*I*A*B - 2*I*B^2)*a^2*b*c*d^2 - (-2*I*A^2 +
 2*I*A*B - I*B^2)*a^3*d^3 + 4*(I*B^2*b^3*d^3*x^3 + I*B^2*a*b^2*c^2*d + (2*I
*B^2*b^3*c*d^2 + I*B^2*a*b^2*d^3)*x^2 + (I*B^2*b^3*c^2*d + 2*I*B^2*a*b^2*c*
d^2)*x)*log((b*x + a)*e/(d*x + c))^3 + 6*((2*I*A^2 - 2*I*A*B + 5*I*B^2)*b^3
*c*d^2 + (-2*I*A^2 + 2*I*A*B - 5*I*B^2)*a*b^2*d^3)*x^2 + 2*(3*(2*I*A*B - I*
B^2)*b^3*d^3*x^3 + 2*I*B^2*b^3*c^3 + 6*I*A*B*a*b^2*c^2*d - 6*I*B^2*a^2*b*c*
d^2 + I*B^2*a^3*d^3 + 3*(4*I*A*B*b^3*c*d^2 + (2*I*A*B - 3*I*B^2)*a*b^2*d^3)
*x^2 + 3*(-I*B^2*a^2*b*d^3 + 2*(I*A*B + I*B^2)*b^3*c^2*d + 4*(I*A*B - I*B^2
)*a*b^2*c*d^2)*x)*log((b*x + a)*e/(d*x + c))^2 + 3*((6*I*A^2 - 2*I*A*B + 13
*I*B^2)*b^3*c^2*d + 2*(-2*I*A^2 - 2*I*A*B - 3*I*B^2)*a*b^2*c*d^2 + (-2*I*A^
2 + 6*I*A*B - 7*I*B^2)*a^2*b*d^3)*x + 2*(3*(2*I*A^2 - 2*I*A*B + 5*I*B^2)*b^
3*d^3*x^3 + 6*I*A^2*a*b^2*c^2*d + 4*(I*A*B + I*B^2)*b^3*c^3 + 12*(-I*A*B +
I*B^2)*a^2*b*c*d^2 + (2*I*A*B - I*B^2)*a^3*d^3 + 3*(4*(I*A^2 + 2*I*B^2)*b^3
*c*d^2 + (2*I*A^2 - 6*I*A*B + 7*I*B^2)*a*b^2*d^3)*x^2 + 3*(2*(I*A^2 + 2*I*A
*B + 2*I*B^2)*b^3*c^2*d + 4*(I*A^2 - 2*I*A*B + 2*I*B^2)*a*b^2*c*d^2 + (-2*I
*A*B + 3*I*B^2)*a^2*b*d^3)*x)*log((b*x + a)*e/(d*x + c)))/((b^5*c^4*d^2 - 4
*a*b^4*c^3*d^3 + 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c*d^5 + a^4*b*d^6)*g^2*x^3 +
 (2*b^5*c^5*d - 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3 - 2*a^3*b^2*c^2*d^4 - 2
*a^4*b*c*d^5 + a^5*d^6)*g^2*x^2 + (b^5*c^6 - 2*a*b^4*c^5*d - 2*a^2*b^3*c^4*
d^2 + 8*a^3*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^5)*g^2*x + (a*b^4*c^6
 - 4*a^2*b^3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d^3 + a^5*c^2*d^4)*g^2
)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^2*(I*d*x + I*
c)^3), x)
```

Mupad [B]
time = 11.56, size = 1505, normalized size = 2.87

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)^2*(c*i + d*i*x)^3
),x)
```

```
[Out] ((4*A^2*b^2*c^2 - 2*A^2*a^2*d^2 - B^2*a^2*d^2 + 8*B^2*b^2*c^2 + 2*A*B*a^2*d
^2 + 8*A*B*b^2*c^2 + 10*A^2*a*b*c*d + 23*B^2*a*b*c*d - 22*A*B*a*b*c*d)/(2*(
a*d - b*c)) + (3*x^2*(2*A^2*b^2*d^2 + 5*B^2*b^2*d^2 - 2*A*B*b^2*d^2))/(a*d
- b*c) + (3*x*(2*A^2*a*b*d^2 + 7*B^2*a*b*d^2 + 6*A^2*b^2*c*d + 13*B^2*b^2*c
*d - 6*A*B*a*b*d^2 - 2*A*B*b^2*c*d))/(2*(a*d - b*c)))/(x*(2*b^3*c^4*g^2*i^3
 + 4*a^3*c*d^3*g^2*i^3 - 6*a^2*b*c^2*d^2*g^2*i^3) + x^2*(2*a^3*d^4*g^2*i^3
+ 4*b^3*c^3*d*g^2*i^3 - 6*a*b^2*c^2*d^2*g^2*i^3) + x^3*(2*b^3*c^2*d^2*g^2*i
^3 + 2*a^2*b*d^4*g^2*i^3 - 4*a*b^2*c*d^3*g^2*i^3) + 2*a^3*c^2*d^2*g^2*i^3 +
 2*a*b^2*c^4*g^2*i^3 - 4*a^2*b*c^3*d*g^2*i^3) - log((e*(a + b*x))/(c + d*x)
)^2*((x*((3*B^2)/(2*g^2*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (3*B^2*(a*d
+ b*c))/(g^2*i^3*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) + (B^2*(a*d
+ 2*b*c))/(2*g^2*i^3*(a^2*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) - (3*B^2*a*c)
/(g^2*i^3*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (3*B^2*b*d*x^2)/(g
^2*i^3*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)))/(d*x^3 + (a*c^2)/(b*d)
 + (x^2*(a*d^2 + 2*b*c*d))/(b*d) + (x*(b*c^2 + 2*a*c*d))/(b*d)) + (3*B*b^2*
d*(2*A - B))/(2*g^2*i^3*(a*d - b*c)^2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - (
log((e*(a + b*x))/(c + d*x))*(x*((3*(B^2 + 2*A*B))/(2*g^2*i^3*(a^2*d^2 + b^
2*c^2 - 2*a*b*c*d)) - (3*B*(2*A - B)*(a*d + b*c))/(g^2*i^3*(a*d - b*c)*(a^2
*d^2 + b^2*c^2 - 2*a*b*c*d))) + (4*B^2*b*c - B^2*a*d + 2*A*B*a*d + 4*A*B*b*
c)/(2*g^2*i^3*(a^2*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) - (3*B*a*c*(2*A - B)
)/(g^2*i^3*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (3*B*b*d*x^2*(2*A
 - B))/(g^2*i^3*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))))/(d*x^3 + (a*
c^2)/(b*d) + (x^2*(a*d^2 + 2*b*c*d))/(b*d) + (x*(b*c^2 + 2*a*c*d))/(b*d)) +
 (b^2*d*atan((b^2*d*(2*A^2 + 5*B^2 - 2*A*B)*(2*a^4*d^4*g^2*i^3 - 2*b^4*c^4*
g^2*i^3 + 4*a*b^3*c^3*d*g^2*i^3 - 4*a^3*b*c*d^3*g^2*i^3)*3i)/(2*g^2*i^3*(a*
d - b*c)^4*(6*A^2*b^2*d + 15*B^2*b^2*d - 6*A*B*b^2*d)) + (b^3*d^2*x*(2*A^2
+ 5*B^2 - 2*A*B)*(a^3*d^3*g^2*i^3 - b^3*c^3*g^2*i^3 + 3*a*b^2*c^2*d*g^2*i^3
 - 3*a^2*b*c*d^2*g^2*i^3)*6i)/(g^2*i^3*(a*d - b*c)^4*(6*A^2*b^2*d + 15*B^2*
b^2*d - 6*A*B*b^2*d)))*(2*A^2 + 5*B^2 - 2*A*B)*3i)/(g^2*i^3*(a*d - b*c)^4)
```

```
- (B^2*b^2*d*log((e*(a + b*x))/(c + d*x))^3)/(g^2*i^3*(a*d - b*c)^2*(a^2*d^
2 + b^2*c^2 - 2*a*b*c*d))
```

3.106 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)^3}\,dx$

Optimal. Leaf size=685

$$\frac{B^2d^4(a+bx)^2}{4(bc-ad)^5g^3i^3(c+dx)^2}+\frac{8AbBd^3(a+bx)}{(bc-ad)^5g^3i^3(c+dx)}-\frac{8bB^2d^3(a+bx)}{(bc-ad)^5g^3i^3(c+dx)}+\frac{8b^3B^2d(c+dx)}{(bc-ad)^5g^3i^3(a+bx)}-\frac{b^4 \cdots}{4(bc-\cdots}$$

```
[Out] 1/4*B^2*d^4*(b*x+a)^2/(-a*d+b*c)^5/g^3/i^3/(d*x+c)^2+8*A*b*B*d^3*(b*x+a)/(-
a*d+b*c)^5/g^3/i^3/(d*x+c)-8*b*B^2*d^3*(b*x+a)/(-a*d+b*c)^5/g^3/i^3/(d*x+c)
+8*b^3*B^2*d*(d*x+c)/(-a*d+b*c)^5/g^3/i^3/(b*x+a)-1/4*b^4*B^2*(d*x+c)^2/(-a
*d+b*c)^5/g^3/i^3/(b*x+a)^2+8*b*B^2*d^3*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/(-a*d
+b*c)^5/g^3/i^3/(d*x+c)-1/2*B*d^4*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a
*d+b*c)^5/g^3/i^3/(d*x+c)^2+8*b^3*B*d*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(
-a*d+b*c)^5/g^3/i^3/(b*x+a)-1/2*b^4*B*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))
/(-a*d+b*c)^5/g^3/i^3/(b*x+a)^2+1/2*d^4*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)
))^2/(-a*d+b*c)^5/g^3/i^3/(d*x+c)^2-4*b*d^3*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+
c)))^2/(-a*d+b*c)^5/g^3/i^3/(d*x+c)+4*b^3*d*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+
c)))^2/(-a*d+b*c)^5/g^3/i^3/(b*x+a)-1/2*b^4*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*
x+c)))^2/(-a*d+b*c)^5/g^3/i^3/(b*x+a)^2+2*b^2*d^2*(A+B*ln(e*(b*x+a)/(d*x+c)
))^3/B/(-a*d+b*c)^5/g^3/i^3
```

Rubi [A]

time = 0.35, antiderivative size = 685, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2562, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^4(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3i^3(a+bx)^2(bc-ad)^5}-\frac{b^4B(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b^3d(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^3i^3(a+bx)(bc-ad)^5}+\frac{8b^3Bd(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^3(a+bx)(bc-ad)^5}+\frac{2b^2d^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{Bg^3i^3(bc-ad)^5}+\frac{d^4(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3i^3(c+dx)^2(bc-ad)^5}-\frac{Bd^4(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^3(c+dx)^2(bc-ad)^5}-\frac{4bd^3(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^3i^3(c+dx)(bc-ad)^5}+\frac{8AbBd^3(a+bx)}{g^3i^3(c+dx)(bc-ad)^5}-\frac{b^4B^2(c+dx)^2}{4g^3i^3(a+bx)^2(bc-ad)^5}+\frac{8b^3B^2d(c+dx)}{g^3i^3(a+bx)(bc-ad)^5}+\frac{B^2d^4(a+bx)^2}{4g^3i^3(c+dx)^2(bc-ad)^5}+\frac{8bB^2d^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{g^3i^3(c+dx)(bc-ad)^5}-\frac{8bB^2d^3(a+bx)}{g^3i^3(c+dx)(bc-ad)^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*i*x)^3
),x]
```

```
[Out] (B^2*d^4*(a + b*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*A*b*B*d^3*
(a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) - (8*b*B^2*d^3*(a + b*x))/((b*
c - a*d)^5*g^3*i^3*(c + d*x)) + (8*b^3*B^2*d*(c + d*x))/((b*c - a*d)^5*g^3*
i^3*(a + b*x)) - (b^4*B^2*(c + d*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2
) + (8*b*B^2*d^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^5*g^3
*i^3*(c + d*x)) - (B*d^4*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*b^3*B*d*(c + d*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B*(c + d*x
)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x
)^2) + (d^4*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a
*d)^5*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c
```

```
 + d*x)])^2)/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*d*(c + d*x)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*(
c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^5*g^3*i^3
*(a + b*x)^2) + (2*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(B*(b*c
- a*d)^5*g^3*i^3)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
```

```
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(106c+106dx)^3(ag+bgx)^3}\,dx = \int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^3g^3(a+bx)^3} - \frac{3b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)^2} \right.$$

$$= \frac{(3b^3d^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{595508(bc-ad)^5g^3} - \frac{(3b^2d^3)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{595508(bc-ad)^5g^3} -$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1191016(bc-ad)^4g^3(a+bx)} -$$

$$= -\frac{b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1191016(bc-ad)^4g^3(a+bx)} -$$

$$= -\frac{3b^2B^2d^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{595508(bc-ad)^5g^3} - \frac{b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc-ad)^3g^3(a+bx)^2}$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} +$$

Mathematica [A]
time = 1.17, size = 611, normalized size = 0.89

$$\frac{(2A^2-2AB+B^2)d^2(bc-ad)^2(a+bx)^2+2b(6A^2-14AB+15B^2)d^2(bc-ad)(a+bx)^2(c+dx)-b^2(2A^2+2AB+B^2)(bc-ad)^2(c+dx)^2+2b^2(6A^2+14AB+15B^2)d(bc-ad)(a+bx)(c+dx)^2+12b^2(2A^2+5B^2)d^2(a+bx)^2(c+dx)^2\log(a+bx)+2B(bc-ad)\left((2A-B)d^2(bc-ad)(a+bx)^2+2b(6A-7B)d^2(a+bx)^2(c+dx)-b^2(2A+B)(bc-ad)(c+dx)^2+2b^2(6A+7B)d(a+bx)(c+dx)^2\right)\log\left(\frac{e(a+bx)}{c+dx}\right)-2B\left(-a^4Bd^4+4a^3bBd^3(2c+dx)-6a^2b^2d^2(2A(c+dx)^2-Bdx(4c+3dx))+b^4(-12Ad^2x^2(c+dx)^2+Bc(c^3-4c^2dx-18cd^2x^2-12d^3x^3))-4ab^3d(6Adx(c+dx)^2+B(2c^3+6c^2dx-3d^3x^3))\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)+8b^2B^2d^2(a+bx)^2(c+dx)^2\log^3\left(\frac{e(a+bx)}{c+dx}\right)-12b^2(2A^2+5B^2)d^2(a+bx)^2(c+dx)^2\log(c+dx)}{4(bc-ad)^5g^3i^3(a+bx)^2(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*
i*x)^3),x]
```

```
[Out] ((2*A^2 - 2*A*B + B^2)*d^2*(b*c - a*d)^2*(a + b*x)^2 + 2*b*(6*A^2 - 14*A*B
+ 15*B^2)*d^2*(b*c - a*d)*(a + b*x)^2*(c + d*x) - b^2*(2*A^2 + 2*A*B + B^2)
*(b*c - a*d)^2*(c + d*x)^2 + 2*b^2*(6*A^2 + 14*A*B + 15*B^2)*d*(b*c - a*d)*
(a + b*x)*(c + d*x)^2 + 12*b^2*(2*A^2 + 5*B^2)*d^2*(a + b*x)^2*(c + d*x)^2*
Log[a + b*x] + 2*B*(b*c - a*d)*((2*A - B)*d^2*(b*c - a*d)*(a + b*x)^2 + 2*b
*(6*A - 7*B)*d^2*(a + b*x)^2*(c + d*x) - b^2*(2*A + B)*(b*c - a*d)*(c + d*x
)^2 + 2*b^2*(6*A + 7*B)*d*(a + b*x)*(c + d*x)^2)*Log[(e*(a + b*x))/(c + d*x
)] - 2*B*(-(a^4*B*d^4) + 4*a^3*b*B*d^3*(2*c + d*x) - 6*a^2*b^2*d^2*(2*A*(c
+ d*x)^2 - B*d*x*(4*c + 3*d*x)) + b^4*(-12*A*d^2*x^2*(c + d*x)^2 + B*c*(c^3
 - 4*c^2*d*x - 18*c*d^2*x^2 - 12*d^3*x^3)) - 4*a*b^3*d*(6*A*d*x*(c + d*x)^2
 + B*(2*c^3 + 6*c^2*d*x - 3*d^3*x^3)))*Log[(e*(a + b*x))/(c + d*x)]^2 + 8*b
^2*B^2*d^2*(a + b*x)^2*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]^3 - 12*b^2*
(2*A^2 + 5*B^2)*d^2*(a + b*x)^2*(c + d*x)^2*Log[c + d*x])/(4*(b*c - a*d)^5*
g^3*i^3*(a + b*x)^2*(c + d*x)^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1588 vs. 2(673) = 1346.
time = 0.90, size = 1589, normalized size = 2.32

method	result	size
derivativedivides	Expression too large to display	1589
default	Expression too large to display	1589
risch	Expression too large to display	2582
norman	Expression too large to display	2758

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(-1/2*d^2*e/i^3/(a*d-b*c)^6/g^3*A^2*b^4/(b*e/d+(a*d-b*c)
*e/d/(d*x+c))^2+4*d^3/i^3/(a*d-b*c)^6/g^3*A^2*b^3/(b*e/d+(a*d-b*c)*e/d/(d*x
+c))+6*d^4/e/i^3/(a*d-b*c)^6/g^3*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-4*
d^5/e^2/i^3/(a*d-b*c)^6/g^3*A^2*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/2*d^6/e^3
/i^3/(a*d-b*c)^6/g^3*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2+2*d^2*e/i^3/(a*d-b
*c)^6/g^3*A*B*b^4*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*
```

```
e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-8*d^3/i^3/(a*d-b*c)^6/g^3
*A*B*b^3*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
1/(b*e/d+(a*d-b*c)*e/d/(d*x+c)))+6*d^4/e/i^3/(a*d-b*c)^6/g^3*A*B*b^2*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))^2-8*d^5/e^2/i^3/(a*d-b*c)^6/g^3*A*B*b*((b*e/d+(a*
d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b
*e/d)+2*d^6/e^3/i^3/(a*d-b*c)^6/g^3*A*B*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)+d^2*
e/i^3/(a*d-b*c)^6/g^3*B^2*b^4*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))^2-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-4*d^3/i^3/(a*d-b*c
)^6/g^3*B^2*b^3*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^2-2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2/
(b*e/d+(a*d-b*c)*e/d/(d*x+c)))+2*d^4/e/i^3/(a*d-b*c)^6/g^3*B^2*b^2*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))^3-4*d^5/e^2/i^3/(a*d-b*c)^6/g^3*B^2*b*((b*e/d+(a*d-
b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*c)*e/d/(d*x+c)+2*b*e/d)+d
^6/e^3/i^3/(a*d-b*c)^6/g^3*B^2*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))^2-1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))+1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5383 vs. $2(640) = 1280$.
time = 1.25, size = 5383, normalized size = 7.86

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] 1/2*B^2*(12*b^2*d^2*log(b*x + a)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*
b^3*c^3*d^2 + 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) - 12
*b^2*d^2*log(d*x + c)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2
 + 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) + (12*b^3*d^3*x
^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*
b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((-I*b^6*c^4*d^
2 + 4*I*a*b^5*c^3*d^3 - 6*I*a^2*b^4*c^2*d^4 + 4*I*a^3*b^3*c*d^5 - I*a^4*b^2
*d^6)*g^3*x^4 + 2*(-I*b^6*c^5*d + 3*I*a*b^5*c^4*d^2 - 2*I*a^2*b^4*c^3*d^3 -
 2*I*a^3*b^3*c^2*d^4 + 3*I*a^4*b^2*c*d^5 - I*a^5*b*d^6)*g^3*x^3 + (-I*b^6*c
^6 + 9*I*a^2*b^4*c^4*d^2 - 16*I*a^3*b^3*c^3*d^3 + 9*I*a^4*b^2*c^2*d^4 - I*a
^6*d^6)*g^3*x^2 + 2*(-I*a*b^5*c^6 + 3*I*a^2*b^4*c^5*d - 2*I*a^3*b^3*c^4*d^2
 - 2*I*a^4*b^2*c^3*d^3 + 3*I*a^5*b*c^2*d^4 - I*a^6*c*d^5)*g^3*x + (-I*a^2*b
^4*c^6 + 4*I*a^3*b^3*c^5*d - 6*I*a^4*b^2*c^4*d^2 + 4*I*a^5*b*c^3*d^3 - I*a^
6*c^2*d^4)*g^3))*log(b*x*e/(d*x + c) + a*e/(d*x + c))^2 + A*B*(12*b^2*d^2*l
og(b*x + a)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 + 10*I*a^
```

3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) - 12*b^2*d^2*log(d*x + c)
/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 + 10*I*a^3*b^2*c^2*d
^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) + (12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^
2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3
*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((-I*b^6*c^4*d^2 + 4*I*a*b^5*c^3*d^3
 - 6*I*a^2*b^4*c^2*d^4 + 4*I*a^3*b^3*c*d^5 - I*a^4*b^2*d^6)*g^3*x^4 + 2*(-I
*b^6*c^5*d + 3*I*a*b^5*c^4*d^2 - 2*I*a^2*b^4*c^3*d^3 - 2*I*a^3*b^3*c^2*d^4
+ 3*I*a^4*b^2*c*d^5 - I*a^5*b*d^6)*g^3*x^3 + (-I*b^6*c^6 + 9*I*a^2*b^4*c^4*
d^2 - 16*I*a^3*b^3*c^3*d^3 + 9*I*a^4*b^2*c^2*d^4 - I*a^6*d^6)*g^3*x^2 + 2*(
-I*a*b^5*c^6 + 3*I*a^2*b^4*c^5*d - 2*I*a^3*b^3*c^4*d^2 - 2*I*a^4*b^2*c^3*d^
3 + 3*I*a^5*b*c^2*d^4 - I*a^6*c*d^5)*g^3*x + (-I*a^2*b^4*c^6 + 4*I*a^3*b^3*
c^5*d - 6*I*a^4*b^2*c^4*d^2 + 4*I*a^5*b*c^3*d^3 - I*a^6*c^2*d^4)*g^3))*log(
b*x*e/(d*x + c) + a*e/(d*x + c)) + 1/2*A^2*(12*b^2*d^2*log(b*x + a)/((-I*b^
5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 + 10*I*a^3*b^2*c^2*d^3 - 5*I
*a^4*b*c*d^4 + I*a^5*d^5)*g^3) - 12*b^2*d^2*log(d*x + c)/((-I*b^5*c^5 + 5*I
*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 + 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^
4 + I*a^5*d^5)*g^3) + (12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c
*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*
d^2 + a^2*b*d^3)*x)/((-I*b^6*c^4*d^2 + 4*I*a*b^5*c^3*d^3 - 6*I*a^2*b^4*c^2*
d^4 + 4*I*a^3*b^3*c*d^5 - I*a^4*b^2*d^6)*g^3*x^4 + 2*(-I*b^6*c^5*d + 3*I*a*
b^5*c^4*d^2 - 2*I*a^2*b^4*c^3*d^3 - 2*I*a^3*b^3*c^2*d^4 + 3*I*a^4*b^2*c*d^5
 - I*a^5*b*d^6)*g^3*x^3 + (-I*b^6*c^6 + 9*I*a^2*b^4*c^4*d^2 - 16*I*a^3*b^3*
c^3*d^3 + 9*I*a^4*b^2*c^2*d^4 - I*a^6*d^6)*g^3*x^2 + 2*(-I*a*b^5*c^6 + 3*I*
a^2*b^4*c^5*d - 2*I*a^3*b^3*c^4*d^2 - 2*I*a^4*b^2*c^3*d^3 + 3*I*a^5*b*c^2*d
^4 - I*a^6*c*d^5)*g^3*x + (-I*a^2*b^4*c^6 + 4*I*a^3*b^3*c^5*d - 6*I*a^4*b^2
*c^4*d^2 + 4*I*a^5*b*c^3*d^3 - I*a^6*c^2*d^4)*g^3)) - 1/4*B^2*(2*(I*b^4*c^4
 - 16*I*a*b^3*c^3*d + 30*I*a^2*b^2*c^2*d^2 - 16*I*a^3*b*c*d^3 + I*a^4*d^4 -
 12*(I*b^4*c^2*d^2 - 2*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)*x^2 - 12*(-I*b^4*d^4*
x^4 - I*a^2*b^2*c^2*d^2 + 2*(-I*b^4*c*d^3 - I*a*b^3*d^4)*x^3 + (-I*b^4*c^2*
d^2 - 4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 + 2*(-I*a*b^3*c^2*d^2 - I*a^2*b^
2*c*d^3)*x)*log(b*x + a)^2 - 24*(I*b^4*d^4*x^4 + I*a^2*b^2*c^2*d^2 + 2*(I*b
^4*c*d^3 + I*a*b^3*d^4)*x^3 + (I*b^4*c^2*d^2 + 4*I*a*b^3*c*d^3 + I*a^2*b^2*
d^4)*x^2 + 2*(I*a*b^3*c^2*d^2 + I*a^2*b^2*c*d^3)*x)*log(b*x + a)*log(d*x +
c) - 12*(-I*b^4*d^4*x^4 - I*a^2*b^2*c^2*d^2 + 2*(-I*b^4*c*d^3 - I*a*b^3*d^4
)*x^3 + (-I*b^4*c^2*d^2 - 4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 + 2*(-I*a*b^
3*c^2*d^2 - I*a^2*b^2*c*d^3)*x)*log(d*x + c)^2 - 12*(I*b^4*c^3*d - I*a*b^3*
c^2*d^2 - I*a^2*b^2*c*d^3 + I*a^3*b*d^4)*x)*log(b*x*e/(d*x + c) + a*e/(d*x
+ c))/(a^2*b^5*c^7*g^3 - 5*a^3*b^4*c^6*d*g^3 + 10*a^4*b^3*c^5*d^2*g^3 - 10*
a^5*b^2*c^4*d^3*g^3 + 5*a^6*b*c^3*d^4*g^3 - a^7*c^2*d^5*g^3 + (b^7*c^5*d^2*
g^3 - 5*a*b^6*c^4*d^3*g^3 + 10*a^2*b^5*c^3*d^4*g^3 - 10*a^3*b^4*c^2*d^5*g^3
 + 5*a^4*b^3*c*d^6*g^3 - a^5*b^2*d^7*g^3)*x^4 + 2*(b^7*c^6*d*g^3 - 4*a*b^6*
c^5*d^2*g^3 + 5*a^2*b^5*c^4*d^3*g^3 - 5*a^4*b^3*c^2*d^5*g^3 + 4*a^5*b^2*c*d
^6*g^3 - a^6*b*d^7*g^3)*x^3 + (b^7*c^7*g^3 - a*b^6*c^6*d*g^3 - 9*a^2*b^5*c^
5*d^2*g^3 + 25*a^3*b^4*c^4*d^3*g^3 - 25*a^4*b^3*c^3*d^4*g^3 + 9*a^5*b^2*c^2
*d^5*g^3 + a^6*b*c*d^6*g^3 - a^7*d^7*g^3)*x^2 + 2*(a*b^6*c^7*g^3 - 4*a^2*b^

```
5*c^6*d*g^3 + 5*a^3*b^4*c^5*d^2*g^3 - 5*a^5*b^2*c^3*d^4*g^3 + 4*a^6*b*c^2*d
^5*g^3 - a^7*c*d^6*g^3)*x) + (I*b^4*c^4 - 32*I*a*b^3*c^3*d + 32*I*a^3*b*c*d
^3 - I*a^4*d^4 - 60*(I*b^4*c*d^3 - I*a*b^3*d^4)*x^3 - 8*(I*b^4*d^4*x^4 + I*
a^2*b^2*c^2*d^2 + 2*(I*b^4*c*d^3 + I*a*b^3*d^4)*x^3 + (I*b^4*c^2*d^2 + 4*I*
a*b^3*c*d^3 + I*a^2*b^2*d^4)*x^2 + 2*(I*a*b^3*c^2*d^2 + I*a^2*b^2*c*d^3)*x)
*log(b*x + a)^3 - 24*(I*b^4*d^4*x^4 + I*a^2*b^2*c^2*d^2 + 2*(I*b^4*c*d^3 +
I*a*b^3*d^4)*x^3 + (I*b^4*c^2*d^2 + 4*I*a*b^3*c...
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1530 vs. $2(640) = 1280$.

time = 0.45, size = 1530, normalized size = 2.23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] -1/4*(60*I*A*B*a^2*b^2*c^2*d^2 + (2*I*A^2 + 2*I*A*B + I*B^2)*b^4*c^4 - 16*(
I*A^2 + 2*I*A*B + 2*I*B^2)*a*b^3*c^3*d - 16*(-I*A^2 + 2*I*A*B - 2*I*B^2)*a^
3*b*c*d^3 + (-2*I*A^2 + 2*I*A*B - I*B^2)*a^4*d^4 - 12*((2*I*A^2 + 5*I*B^2)*
b^4*c*d^3 + (-2*I*A^2 - 5*I*B^2)*a*b^3*d^4)*x^3 - 8*(I*B^2*b^4*d^4*x^4 + I*
B^2*a^2*b^2*c^2*d^2 + 2*(I*B^2*b^4*c*d^3 + I*B^2*a*b^3*d^4)*x^3 + (I*B^2*b^
4*c^2*d^2 + 4*I*B^2*a*b^3*c*d^3 + I*B^2*a^2*b^2*d^4)*x^2 + 2*(I*B^2*a*b^3*c
^2*d^2 + I*B^2*a^2*b^2*c*d^3)*x)*log((b*x + a)*e/(d*x + c))^3 - 6*(-8*I*A*B
*a*b^3*c*d^3 + (6*I*A^2 + 4*I*A*B + 15*I*B^2)*b^4*c^2*d^2 + (-6*I*A^2 + 4*I
*A*B - 15*I*B^2)*a^2*b^2*d^4)*x^2 - 2*(12*I*A*B*b^4*d^4*x^4 - I*B^2*b^4*c^4
 + 8*I*B^2*a*b^3*c^3*d + 12*I*A*B*a^2*b^2*c^2*d^2 - 8*I*B^2*a^3*b*c*d^3 + I
*B^2*a^4*d^4 + 12*((2*I*A*B + I*B^2)*b^4*c*d^3 + (2*I*A*B - I*B^2)*a*b^3*d^
4)*x^3 + 6*(8*I*A*B*a*b^3*c*d^3 + (2*I*A*B + 3*I*B^2)*b^4*c^2*d^2 + (2*I*A*
B - 3*I*B^2)*a^2*b^2*d^4)*x^2 + 4*(I*B^2*b^4*c^3*d - I*B^2*a^3*b*d^4 + 6*(I
*A*B + I*B^2)*a*b^3*c^2*d^2 + 6*(I*A*B - I*B^2)*a^2*b^2*c*d^3)*x)*log((b*x
+ a)*e/(d*x + c))^2 - 4*((2*I*A^2 + 6*I*A*B + 7*I*B^2)*b^4*c^3*d + 6*(2*I*A
^2 - I*A*B + 4*I*B^2)*a*b^3*c^2*d^2 + 6*(-2*I*A^2 - I*A*B - 4*I*B^2)*a^2*b^
2*c*d^3 + (-2*I*A^2 + 6*I*A*B - 7*I*B^2)*a^3*b*d^4)*x - 2*(6*(2*I*A^2 + 5*I
*B^2)*b^4*d^4*x^4 + 12*I*A^2*a^2*b^2*c^2*d^2 + (-2*I*A*B - I*B^2)*b^4*c^4 +
 16*(I*A*B + I*B^2)*a*b^3*c^3*d + 16*(-I*A*B + I*B^2)*a^3*b*c*d^3 + (2*I*A*
B - I*B^2)*a^4*d^4 + 12*((2*I*A^2 + 2*I*A*B + 5*I*B^2)*b^4*c*d^3 + (2*I*A^2
 - 2*I*A*B + 5*I*B^2)*a*b^3*d^4)*x^3 + 6*((2*I*A^2 + 6*I*A*B + 7*I*B^2)*b^4
*c^2*d^2 + 8*(I*A^2 + 2*I*B^2)*a*b^3*c*d^3 + (2*I*A^2 - 6*I*A*B + 7*I*B^2)*
a^2*b^2*d^4)*x^2 + 4*((2*I*A*B + 3*I*B^2)*b^4*c^3*d + 6*(I*A^2 + 2*I*A*B +
2*I*B^2)*a*b^3*c^2*d^2 + 6*(I*A^2 - 2*I*A*B + 2*I*B^2)*a^2*b^2*c*d^3 + (-2*
I*A*B + 3*I*B^2)*a^3*b*d^4)*x)*log((b*x + a)*e/(d*x + c)))/((b^7*c^5*d^2 -
5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a^3*b^4*c^2*d^5 + 5*a^4*b^3*c*d^6
 - a^5*b^2*d^7)*g^3*x^4 + 2*(b^7*c^6*d - 4*a*b^6*c^5*d^2 + 5*a^2*b^5*c^4*d^
```

```
3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a^6*b*d^7)*g^3*x^3 + (b^7*c^7 - a
*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4*c^4*d^3 - 25*a^4*b^3*c^3*d^4 +
9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*g^3*x^2 + 2*(a*b^6*c^7 - 4*a^2*b
^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2*c^3*d^4 + 4*a^6*b*c^2*d^5 - a^7*c*
d^6)*g^3*x + (a^2*b^5*c^7 - 5*a^3*b^4*c^6*d + 10*a^4*b^3*c^5*d^2 - 10*a^5*b
^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c^2*d^5)*g^3)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^3*(I*d*x + I*
c)^3), x)
```

Mupad [B]
time = 14.31, size = 2155, normalized size = 3.15

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)^3*(c*i + d*i*x)^3
),x)
```

```
[Out] ((2*x*(2*A^2*a^2*b*d^3 + 7*B^2*a^2*b*d^3 + 2*A^2*b^3*c^2*d + 7*B^2*b^3*c^2*
d + 14*A^2*a*b^2*c*d^2 + 31*B^2*a*b^2*c*d^2 - 6*A*B*a^2*b*d^3 + 6*A*B*b^3*c
^2*d))/(a*d - b*c) - (2*A^2*a^3*d^3 + 2*A^2*b^3*c^3 + B^2*a^3*d^3 + B^2*b^3
*c^3 - 2*A*B*a^3*d^3 + 2*A*B*b^3*c^3 - 14*A^2*a*b^2*c^2*d - 14*A^2*a^2*b*c*
d^2 - 31*B^2*a*b^2*c^2*d - 31*B^2*a^2*b*c*d^2 - 30*A*B*a*b^2*c^2*d + 30*A*B
*a^2*b*c*d^2)/(2*(a*d - b*c)) + (6*x^3*(2*A^2*b^3*d^3 + 5*B^2*b^3*d^3))/(a*
d - b*c) + (3*x^2*(6*A^2*a*b^2*d^3 + 15*B^2*a*b^2*d^3 + 6*A^2*b^3*c*d^2 + 1
5*B^2*b^3*c*d^2 - 4*A*B*a*b^2*d^3 + 4*A*B*b^3*c*d^2))/(a*d - b*c))/(x^4*(2*
```

```
a^3*b^2*d^5*g^3*i^3 - 2*b^5*c^3*d^2*g^3*i^3 + 6*a*b^4*c^2*d^3*g^3*i^3 - 6*a
^2*b^3*c*d^4*g^3*i^3) - x*(4*a*b^4*c^5*g^3*i^3 - 4*a^5*c*d^4*g^3*i^3 - 8*a^
2*b^3*c^4*d*g^3*i^3 + 8*a^4*b*c^2*d^3*g^3*i^3) + x^3*(4*a^4*b*d^5*g^3*i^3 -
 4*b^5*c^4*d*g^3*i^3 + 8*a*b^4*c^3*d^2*g^3*i^3 - 8*a^3*b^2*c*d^4*g^3*i^3) +
 x^2*(2*a^5*d^5*g^3*i^3 - 2*b^5*c^5*g^3*i^3 - 2*a*b^4*c^4*d*g^3*i^3 + 2*a^4
*b*c*d^4*g^3*i^3 + 16*a^2*b^3*c^3*d^2*g^3*i^3 - 16*a^3*b^2*c^2*d^3*g^3*i^3)
 - 2*a^2*b^3*c^5*g^3*i^3 + 2*a^5*c^2*d^3*g^3*i^3 + 6*a^3*b^2*c^4*d*g^3*i^3
- 6*a^4*b*c^3*d^2*g^3*i^3) + log((e*(a + b*x))/(c + d*x))^2*((x*((3*B^2*(a*
d + b*c)^2)/(g^3*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) - B^2/(g^3*i^3*(a^2
*d^2 + b^2*c^2 - 2*a*b*c*d)) + (6*B^2*a*b*c*d)/(g^3*i^3*(a^2*d^2 + b^2*c^2
- 2*a*b*c*d)^2)) - (B^2*(a*d + b*c))/(2*g^3*i^3*(a^2*b*d^3 + b^3*c^2*d - 2*
a*b^2*c*d^2)) + (6*B^2*b^2*d^2*x^3)/(g^3*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d
)^2) + (3*B^2*a*c*(a*d + b*c))/(g^3*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2)
+ (9*B^2*b*d*x^2*(a*d + b*c))/(g^3*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2))/
(b*d*x^4 + (a^2*c^2)/(b*d) + (x*(2*a*b*c^2 + 2*a^2*c*d))/(b*d) + (x^2*(a^2*
d^2 + b^2*c^2 + 4*a*b*c*d))/(b*d) + (x^3*(2*a*b*d^2 + 2*b^2*c*d))/(b*d)) -
(6*A*B*b^2*d^2)/(g^3*i^3*(a*d - b*c)^5)) + (log((e*(a + b*x))/(c + d*x))*(x
^2*((6*b*d*(B^2*b*c - B^2*a*d + A*B*a*d + A*B*b*c))/(g^3*i^3*(a^2*d^2 + b^2
*c^2 - 2*a*b*c*d)^2) + (12*A*B*b*d*(a*d + b*c))/(g^3*i^3*(a^2*d^2 + b^2*c^2
 - 2*a*b*c*d)^2)) + x*((6*(a*d + b*c)*(B^2*b*c - B^2*a*d + A*B*a*d + A*B*b*
c))/(g^3*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) - (2*A*B)/(g^3*i^3*(a^2*d^2
 + b^2*c^2 - 2*a*b*c*d)) + (12*A*B*a*b*c*d)/(g^3*i^3*(a^2*d^2 + b^2*c^2 - 2
*a*b*c*d)^2)) - (B^2*b*c - B^2*a*d + 2*A*B*a*d + 2*A*B*b*c)/(2*g^3*i^3*(a^2
*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) + (6*a*c*(B^2*b*c - B^2*a*d + A*B*a*d
+ A*B*b*c))/(g^3*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (12*A*B*b^2*d^2*x
^3)/(g^3*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2)))/(b*d*x^4 + (a^2*c^2)/(b*d
) + (x*(2*a*b*c^2 + 2*a^2*c*d))/(b*d) + (x^2*(a^2*d^2 + b^2*c^2 + 4*a*b*c*d
))/(b*d) + (x^3*(2*a*b*d^2 + 2*b^2*c*d))/(b*d)) - (2*B^2*b^2*d^2*log((e*(a
+ b*x))/(c + d*x))^3)/(g^3*i^3*(a*d - b*c)^5) + (b^2*d^2*atan((b^2*d^2*((a^
5*d^5*g^3*i^3 + b^5*c^5*g^3*i^3 - 3*a*b^4*c^4*d*g^3*i^3 - 3*a^4*b*c*d^4*g^3
*i^3 + 2*a^2*b^3*c^3*d^2*g^3*i^3 + 2*a^3*b^2*c^2*d^3*g^3*i^3)/(a^4*d^4*g^3*
i^3 + b^4*c^4*g^3*i^3 - 4*a*b^3*c^3*d*g^3*i^3 - 4*a^3*b*c*d^3*g^3*i^3 + 6*a
^2*b^2*c^2*d^2*g^3*i^3) + 2*b*d*x)*(2*A^2 + 5*B^2)*(a^4*d^4*g^3*i^3 + b^4*c
^4*g^3*i^3 - 4*a*b^3*c^3*d*g^3*i^3 - 4*a^3*b*c*d^3*g^3*i^3 + 6*a^2*b^2*c^2*
d^2*g^3*i^3)*3i)/(g^3*i^3*(6*A^2*b^2*d^2 + 15*B^2*b^2*d^2)*(a*d - b*c)^5))*
(2*A^2 + 5*B^2)*6i)/(g^3*i^3*(a*d - b*c)^5)
```

3.107 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)^3}\,dx$

Optimal. Leaf size=851

$$-\frac{B^2d^5(a+bx)^2}{4(bc-ad)^6g^4i^3(c+dx)^2}-\frac{10AbBd^4(a+bx)}{(bc-ad)^6g^4i^3(c+dx)}+\frac{10bB^2d^4(a+bx)}{(bc-ad)^6g^4i^3(c+dx)}-\frac{20b^3B^2d^2(c+dx)}{(bc-ad)^6g^4i^3(a+bx)}+\frac{5\cdots}{4(bc-\cdots}$$

```
[Out] -1/4*B^2*d^5*(b*x+a)^2/(-a*d+b*c)^6/g^4/i^3/(d*x+c)^2-10*A*b*B*d^4*(b*x+a)/
(-a*d+b*c)^6/g^4/i^3/(d*x+c)+10*b*B^2*d^4*(b*x+a)/(-a*d+b*c)^6/g^4/i^3/(d*x
+c)-20*b^3*B^2*d^2*(d*x+c)/(-a*d+b*c)^6/g^4/i^3/(b*x+a)+5/4*b^4*B^2*d*(d*x+
c)^2/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^2-2/27*b^5*B^2*(d*x+c)^3/(-a*d+b*c)^6/g^4
/i^3/(b*x+a)^3-10*b*B^2*d^4*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/(-a*d+b*c)^6/g^4/
i^3/(d*x+c)+1/2*B*d^5*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^6/g^
4/i^3/(d*x+c)^2-20*b^3*B*d^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)
^6/g^4/i^3/(b*x+a)+5/2*b^4*B*d*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+
b*c)^6/g^4/i^3/(b*x+a)^2-2/9*b^5*B*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-
a*d+b*c)^6/g^4/i^3/(b*x+a)^3-1/2*d^5*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^
2/(-a*d+b*c)^6/g^4/i^3/(d*x+c)^2+5*b*d^4*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c))
)^2/(-a*d+b*c)^6/g^4/i^3/(d*x+c)-10*b^3*d^2*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+
c)))^2/(-a*d+b*c)^6/g^4/i^3/(b*x+a)+5/2*b^4*d*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(
d*x+c)))^2/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^2-1/3*b^5*(d*x+c)^3*(A+B*ln(e*(b*x+
a)/(d*x+c)))^2/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^3-10/3*b^2*d^3*(A+B*ln(e*(b*x+a
)/(d*x+c)))^3/B/(-a*d+b*c)^6/g^4/i^3
```

Rubi [A]

time = 0.43, antiderivative size = 851, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 8, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2562, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{2B^2(c+dx)^3b^5}{27(bc-ad)^6g^4i^3(a+bx)^3}-\frac{(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2b^5}{3(bc-ad)^6g^4i^3(a+bx)^3}-\frac{2B(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^5}{9(bc-ad)^6g^4i^3(a+bx)^3}+\frac{5B^2d(c+dx)^2b^4}{4(bc-ad)^6g^4i^3(a+bx)^2}+\frac{5d(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2b^4}{2(bc-ad)^6g^4i^3(a+bx)^2}+\frac{5Bd(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^4}{2(bc-ad)^6g^4i^3(a+bx)^2}-\frac{10d^2(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2b^3}{(bc-ad)^6g^4i^3(a+bx)}-\frac{20B^2d^2(c+dx)b^3}{(bc-ad)^6g^4i^3(a+bx)}-\frac{20Bd^2(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^3}{(bc-ad)^6g^4i^3(a+bx)}-\frac{10d^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^3b^2}{3B(bc-ad)^6g^4i^3}+\frac{5d^4(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2b}{(bc-ad)^6g^4i^3(c+dx)}-\frac{10B^2d^4(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)b}{(bc-ad)^6g^4i^3(c+dx)}+\frac{10B^2d^4(a+bx)b}{(bc-ad)^6g^4i^3(c+dx)}-\frac{10ABd^4(a+bx)b}{(bc-ad)^6g^4i^3(c+dx)}-\frac{d^5(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2(bc-ad)^6g^4i^3(c+dx)^2}+\frac{Bd^5(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2(bc-ad)^6g^4i^3(c+dx)^2}-\frac{B^2d^5(a+bx)^2}{4(bc-ad)^6g^4i^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*i*x)^3
),x]
```

```
[Out] -1/4*(B^2*d^5*(a + b*x)^2)/((b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (10*A*b*B*
d^4*(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) + (10*b*B^2*d^4*(a + b*x))
/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (20*b^3*B^2*d^2*(c + d*x))/((b*c - a*d
)^6*g^4*i^3*(a + b*x)) + (5*b^4*B^2*d*(c + d*x)^2)/(4*(b*c - a*d)^6*g^4*i^3
*(a + b*x)^2) - (2*b^5*B^2*(c + d*x)^3)/(27*(b*c - a*d)^6*g^4*i^3*(a + b*x)
^3) - (10*b*B^2*d^4*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^6*
g^4*i^3*(c + d*x)) + (B*d^5*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (20*b^3*B*d^2*(c + d*x)*(A + B*L
```

```
og[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*
d*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^6*g^4*i^
3*(a + b*x)^2) - (2*b^5*B*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(9*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (d^5*(a + b*x)^2*(A + B*Log[(e*(a
+ b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) + (5*b*d^4*(a
+ b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^6*g^4*i^3*(c +
d*x)) - (10*b^3*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c
 - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2)/(2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*(c + d*x)^3*(
A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3
) - (10*b^2*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^6*
g^4*i^3)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2562

```
Int[((A_.) + Log[(e_.)*((a_.) + (b_.)*(x_))^(n_.)*((c_.) + (d_.)*(x_))^(mn_
)]*(B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Sy
mbol] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A +
B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /;
FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && EqQ[n + mn, 0] && IGtQ
[n, 0] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && In
tegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(107c+107dx)^3(ag+bgx)^4}\,dx = -\frac{2b^2B^2}{33076161(bc-ad)^3g^4(a+bx)^3}+\frac{37b^2B^2d}{44101548(bc-ad)^4g^4(a+bx)^2}-$$

Mathematica [A]
time = 1.70, size = 793, normalized size = 0.93

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*
i*x)^3),x]
```

```
[Out] -1/108*(27*(2*A^2 - 2*A*B + B^2)*d^3*(b*c - a*d)^2*(a + b*x)^3 + 54*b*(8*A^
2 - 18*A*B + 19*B^2)*d^3*(b*c - a*d)*(a + b*x)^3*(c + d*x) + 4*b^2*(9*A^2 +
 6*A*B + 2*B^2)*(b*c - a*d)^3*(c + d*x)^2 - 3*b^2*(54*A^2 + 66*A*B + 37*B^2
)*d*(b*c - a*d)^2*(a + b*x)*(c + d*x)^2 + 6*b^2*(108*A^2 + 282*A*B + 319*B^
2)*d^2*(b*c - a*d)*(a + b*x)^2*(c + d*x)^2 + 60*b^2*(18*A^2 + 12*A*B + 49*B
^2)*d^3*(a + b*x)^3*(c + d*x)^2*Log[a + b*x] + 6*B*(b*c - a*d)*(9*(2*A - B)
*d^3*(b*c - a*d)*(a + b*x)^3 + 18*b*(8*A - 9*B)*d^3*(a + b*x)^3*(c + d*x) +
 4*b^2*(3*A + B)*(b*c - a*d)^2*(c + d*x)^2 - 3*b^2*(18*A + 11*B)*d*(b*c - a
*d)*(a + b*x)*(c + d*x)^2 + 6*b^2*(36*A + 47*B)*d^2*(a + b*x)^2*(c + d*x)^2
)*Log[(e*(a + b*x))/(c + d*x)] + 18*B*(3*a^5*B*d^5 - 15*a^4*b*B*d^4*(2*c +
```

```
d*x) + 30*a^3*b^2*d^3*(2*A*(c + d*x)^2 - B*d*x*(4*c + 3*d*x)) + 30*a^2*b^3*
d^2*(6*A*d*x*(c + d*x)^2 + B*(2*c^3 + 6*c^2*d*x - 3*d^3*x^3)) + 15*a*b^4*d*
(12*A*d^2*x^2*(c + d*x)^2 + B*c*(-c^3 + 4*c^2*d*x + 18*c*d^2*x^2 + 12*d^3*x
^3)) + b^5*(60*A*d^3*x^3*(c + d*x)^2 + B*(2*c^5 - 5*c^4*d*x + 20*c^3*d^2*x^
2 + 110*c^2*d^3*x^3 + 100*c*d^4*x^4 + 20*d^5*x^5)))*Log[(e*(a + b*x))/(c +
d*x)]^2 + 360*b^2*B^2*d^3*(a + b*x)^3*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*
x)]^3 - 60*b^2*(18*A^2 + 12*A*B + 49*B^2)*d^3*(a + b*x)^3*(c + d*x)^2*Log[c
 + d*x])/((b*c - a*d)^6*g^4*i^3*(a + b*x)^3*(c + d*x)^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1950 vs. $2(831) = 1662$.

time = 1.13, size = 1951, normalized size = 2.29

method	result	size
derivativedivides	Expression too large to display	1951
default	Expression too large to display	1951
risch	Expression too large to display	3021
norman	Expression too large to display	4027

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x,method=_RET
URNVERBOSE)
```

```
[Out] -1/d^2*e*(a*d-b*c)*(1/3*d^2*e^2/i^3/(a*d-b*c)^7/g^4*A^2*b^5/(b*e/d+(a*d-b*c
)*e/d/(d*x+c))^3-5/2*d^3*e/i^3/(a*d-b*c)^7/g^4*A^2*b^4/(b*e/d+(a*d-b*c)*e/d
/(d*x+c))^2+10*d^4/i^3/(a*d-b*c)^7/g^4*A^2*b^3/(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)+10*d^5/e/i^3/(a*d-b*c)^7/g^4*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-5*d^
6/e^2/i^3/(a*d-b*c)^7/g^4*A^2*b*(b*e/d+(a*d-b*c)*e/d/(d*x+c))+1/2*d^7/e^3/i
^3/(a*d-b*c)^7/g^4*A^2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*d^2*e^2/i^3/(a*d-b
*c)^7/g^4*A*B*b^5*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))-1/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)+10*d^3*e/i^3/(a*d-b*c)^7/
g^4*A*B*b^4*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-20*d^4/i^3/(a*d-b*c)^7/g^4*A*B*
b^3*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/(b*
e/d+(a*d-b*c)*e/d/(d*x+c)))+10*d^5/e/i^3/(a*d-b*c)^7/g^4*A*B*b^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^2-10*d^6/e^2/i^3/(a*d-b*c)^7/g^4*A*B*b*((b*e/d+(a*d-b
*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-(a*d-b*c)*e/d/(d*x+c)-b*e/
d)+2*d^7/e^3/i^3/(a*d-b*c)^7/g^4*A*B*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))-1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-d^2*e^2
/i^3/(a*d-b*c)^7/g^4*B^2*b^5*(-1/3/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))^2-2/9/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))-2/27/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3)+5*d^3*e/i^3/(a*d-b
*c)^7/g^4*B^2*b^4*(-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^2-1/2/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))-1/4/(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2)-10*d^4/i^3/(a*d-b*c)^7/g^4*B^2
```

```
*b^3*(-1/(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2/
(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-2/(b*e/d+(a*d
-b*c)*e/d/(d*x+c)))+10/3*d^5/e/i^3/(a*d-b*c)^7/g^4*B^2*b^2*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))^3-5*d^6/e^2/i^3/(a*d-b*c)^7/g^4*B^2*b*((b*e/d+(a*d-b*c)*e/d
/(d*x+c))*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2-2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))+2*(a*d-b*c)*e/d/(d*x+c)+2*b*e/d)+d^7/e^3/i
^3/(a*d-b*c)^7/g^4*B^2*(1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^2-1/2*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))+1/4*(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2))
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 8906 vs. $2(791) = 1582$.
time = 2.37, size = 8906, normalized size = 10.47

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] 1/6*B^2*(60*b^2*d^3*log(b*x + a)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b
^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5
+ I*a^6*d^6)*g^4) - 60*b^2*d^3*log(d*x + c)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d +
 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a
^5*b*c*d^5 + I*a^6*d^6)*g^4) + (60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d
 + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*
b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5
*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((I*b^8
*c^5*d^2 - 5*I*a*b^7*c^4*d^3 + 10*I*a^2*b^6*c^3*d^4 - 10*I*a^3*b^5*c^2*d^5
+ 5*I*a^4*b^4*c*d^6 - I*a^5*b^3*d^7)*g^4*x^5 + (2*I*b^8*c^6*d - 7*I*a*b^7*c
^5*d^2 + 5*I*a^2*b^6*c^4*d^3 + 10*I*a^3*b^5*c^3*d^4 - 20*I*a^4*b^4*c^2*d^5
+ 13*I*a^5*b^3*c*d^6 - 3*I*a^6*b^2*d^7)*g^4*x^4 + (I*b^8*c^7 + I*a*b^7*c^6*
d - 17*I*a^2*b^6*c^5*d^2 + 35*I*a^3*b^5*c^4*d^3 - 25*I*a^4*b^4*c^3*d^4 - I*
a^5*b^3*c^2*d^5 + 9*I*a^6*b^2*c*d^6 - 3*I*a^7*b*d^7)*g^4*x^3 + (3*I*a*b^7*c
^7 - 9*I*a^2*b^6*c^6*d + I*a^3*b^5*c^5*d^2 + 25*I*a^4*b^4*c^4*d^3 - 35*I*a^
5*b^3*c^3*d^4 + 17*I*a^6*b^2*c^2*d^5 - I*a^7*b*c*d^6 - I*a^8*d^7)*g^4*x^2 +
 (3*I*a^2*b^6*c^7 - 13*I*a^3*b^5*c^6*d + 20*I*a^4*b^4*c^5*d^2 - 10*I*a^5*b^
3*c^4*d^3 - 5*I*a^6*b^2*c^3*d^4 + 7*I*a^7*b*c^2*d^5 - 2*I*a^8*c*d^6)*g^4*x
+ (I*a^3*b^5*c^7 - 5*I*a^4*b^4*c^6*d + 10*I*a^5*b^3*c^5*d^2 - 10*I*a^6*b^2*
c^4*d^3 + 5*I*a^7*b*c^3*d^4 - I*a^8*c^2*d^5)*g^4))*log(b*x*e/(d*x + c) + a*
e/(d*x + c))^2 + 1/3*A*B*(60*b^2*d^3*log(b*x + a)/((I*b^6*c^6 - 6*I*a*b^5*c
^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 -
 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) - 60*b^2*d^3*log(d*x + c)/((I*b^6*c^6 -
6*I*a*b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^
2*c^2*d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) + (60*b^4*d^4*x^4 + 2*b^4*c^4
```

```
 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3
*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2
*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*
b*d^4)*x)/((I*b^8*c^5*d^2 - 5*I*a*b^7*c^4*d^3 + 10*I*a^2*b^6*c^3*d^4 - 10*I
*a^3*b^5*c^2*d^5 + 5*I*a^4*b^4*c*d^6 - I*a^5*b^3*d^7)*g^4*x^5 + (2*I*b^8*c^
6*d - 7*I*a*b^7*c^5*d^2 + 5*I*a^2*b^6*c^4*d^3 + 10*I*a^3*b^5*c^3*d^4 - 20*I
*a^4*b^4*c^2*d^5 + 13*I*a^5*b^3*c*d^6 - 3*I*a^6*b^2*d^7)*g^4*x^4 + (I*b^8*c
^7 + I*a*b^7*c^6*d - 17*I*a^2*b^6*c^5*d^2 + 35*I*a^3*b^5*c^4*d^3 - 25*I*a^4
*b^4*c^3*d^4 - I*a^5*b^3*c^2*d^5 + 9*I*a^6*b^2*c*d^6 - 3*I*a^7*b*d^7)*g^4*x
^3 + (3*I*a*b^7*c^7 - 9*I*a^2*b^6*c^6*d + I*a^3*b^5*c^5*d^2 + 25*I*a^4*b^4*
c^4*d^3 - 35*I*a^5*b^3*c^3*d^4 + 17*I*a^6*b^2*c^2*d^5 - I*a^7*b*c*d^6 - I*a
^8*d^7)*g^4*x^2 + (3*I*a^2*b^6*c^7 - 13*I*a^3*b^5*c^6*d + 20*I*a^4*b^4*c^5*
d^2 - 10*I*a^5*b^3*c^4*d^3 - 5*I*a^6*b^2*c^3*d^4 + 7*I*a^7*b*c^2*d^5 - 2*I*
a^8*c*d^6)*g^4*x + (I*a^3*b^5*c^7 - 5*I*a^4*b^4*c^6*d + 10*I*a^5*b^3*c^5*d^
2 - 10*I*a^6*b^2*c^4*d^3 + 5*I*a^7*b*c^3*d^4 - I*a^8*c^2*d^5)*g^4))*log(b*x
*e/(d*x + c) + a*e/(d*x + c)) + 1/6*A^2*(60*b^2*d^3*log(b*x + a)/((I*b^6*c^
6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^
4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) - 60*b^2*d^3*log(d*x + c)
/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^
3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) + (60*b^4*d^4*
x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*
a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3
*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2
*c*d^3 - 3*a^3*b*d^4)*x)/((I*b^8*c^5*d^2 - 5*I*a*b^7*c^4*d^3 + 10*I*a^2*b^6
*c^3*d^4 - 10*I*a^3*b^5*c^2*d^5 + 5*I*a^4*b^4*c*d^6 - I*a^5*b^3*d^7)*g^4*x^
5 + (2*I*b^8*c^6*d - 7*I*a*b^7*c^5*d^2 + 5*I*a^2*b^6*c^4*d^3 + 10*I*a^3*b^5
*c^3*d^4 - 20*I*a^4*b^4*c^2*d^5 + 13*I*a^5*b^3*c*d^6 - 3*I*a^6*b^2*d^7)*g^4
*x^4 + (I*b^8*c^7 + I*a*b^7*c^6*d - 17*I*a^2*b^6*c^5*d^2 + 35*I*a^3*b^5*c^4
*d^3 - 25*I*a^4*b^4*c^3*d^4 - I*a^5*b^3*c^2*d^5 + 9*I*a^6*b^2*c*d^6 - 3*I*a
^7*b*d^7)*g^4*x^3 + (3*I*a*b^7*c^7 - 9*I*a^2*b^6*c^6*d + I*a^3*b^5*c^5*d^2
+ 25*I*a^4*b^4*c^4*d^3 - 35*I*a^5*b^3*c^3*d^4 + 17*I*a^6*b^2*c^2*d^5 - I*a^
7*b*c*d^6 - I*a^8*d^7)*g^4*x^2 + (3*I*a^2*b^6*c^7 - 13*I*a^3*b^5*c^6*d + 20
*I*a^4*b^4*c^5*d^2 - 10*I*a^5*b^3*c^4*d^3 - 5*I*a^6*b^2*c^3*d^4 + 7*I*a^7*b
*c^2*d^5 - 2*I*a^8*c*d^6)*g^4*x + (I*a^3*b^5*c^7 - 5*I*a^4*b^4*c^6*d + 10*I
*a^5*b^3*c^5*d^2 - 10*I*a^6*b^2*c^4*d^3 + 5*I*a^7*b*c^3*d^4 - I*a^8*c^2*d^5
)*g^4)) + 1/108*B^2*(6*(-4*I*b^5*c^5 + 45*I*a*b^4*c^4*d - 360*I*a^2*b^3*c^3
*d^2 + 490*I*a^3*b^2*c^2*d^3 - 180*I*a^4*b*c*d^4 + 9*I*a^5*d^5 - 120*(I*b^5
*c*d^4 - I*a*b^4*d^5)*x^4 - 120*(3*I*b^5*c^2*d^3 - 2*I*a*b^4*c*d^4 - I*a^2*
b^3*d^5)*x^3 - 20*(11*I*b^5*c^3*d^2 + 21*I*a*b^4*c^2*d^3 - 39*I*a^2*b^3*c*d
^4 + 7*I*a^3*b^2*d^5)*x^2 - 180*(-I*b^5*d^5*x^5 - I*a^3*b^2*c^2*d^3 + (-2*I
*b^5*c*d^4 - 3*I*a*b^4*d^5)*x^4 + (-I*b^5*c^2*d^3 - 6*I*a*b^4*c*d^4 - 3*I*a
^2*b^3*d^5)*x^3 + (-3*I*a*b^4*c^2*d^3 - 6*I*a^2...
```

<u>Fricas</u> [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2268 vs. $2(791) = 1582$.

time = 0.50, size = 2268, normalized size = 2.67

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] -1/108*(4*(9*I*A^2 + 6*I*A*B + 2*I*B^2)*b^5*c^5 + 135*(-2*I*A^2 - 2*I*A*B -
 I*B^2)*a*b^4*c^4*d + 1080*(I*A^2 + 2*I*A*B + 2*I*B^2)*a^2*b^3*c^3*d^2 + 20
*(-18*I*A^2 - 147*I*A*B - 49*I*B^2)*a^3*b^2*c^2*d^3 + 540*(-I*A^2 + 2*I*A*B
 - 2*I*B^2)*a^4*b*c*d^4 + 27*(2*I*A^2 - 2*I*A*B + I*B^2)*a^5*d^5 + 60*((18*
I*A^2 + 12*I*A*B + 49*I*B^2)*b^5*c*d^4 + (-18*I*A^2 - 12*I*A*B - 49*I*B^2)*
a*b^4*d^5)*x^4 + 30*(3*(18*I*A^2 + 24*I*A*B + 53*I*B^2)*b^5*c^2*d^3 + 2*(18
*I*A^2 - 24*I*A*B + 37*I*B^2)*a*b^4*c*d^4 + (-90*I*A^2 - 24*I*A*B - 233*I*B
^2)*a^2*b^3*d^5)*x^3 + 360*(I*B^2*b^5*d^5*x^5 + I*B^2*a^3*b^2*c^2*d^3 + (2*
I*B^2*b^5*c*d^4 + 3*I*B^2*a*b^4*d^5)*x^4 + (I*B^2*b^5*c^2*d^3 + 6*I*B^2*a*b
^4*c*d^4 + 3*I*B^2*a^2*b^3*d^5)*x^3 + (3*I*B^2*a*b^4*c^2*d^3 + 6*I*B^2*a^2*
b^3*c*d^4 + I*B^2*a^3*b^2*d^5)*x^2 + (3*I*B^2*a^2*b^3*c^2*d^3 + 2*I*B^2*a^3
*b^2*c*d^4)*x)*log((b*x + a)*e/(d*x + c))^3 + 10*(2*(18*I*A^2 + 66*I*A*B +
85*I*B^2)*b^5*c^3*d^2 + 3*(126*I*A^2 + 84*I*A*B + 307*I*B^2)*a*b^4*c^2*d^3
+ 12*(-18*I*A^2 - 39*I*A*B - 49*I*B^2)*a^2*b^3*c*d^4 + (-198*I*A^2 + 84*I*A
*B - 503*I*B^2)*a^3*b^2*d^5)*x^2 + 18*(20*(3*I*A*B + I*B^2)*b^5*d^5*x^5 + 2
*I*B^2*b^5*c^5 - 15*I*B^2*a*b^4*c^4*d + 60*I*B^2*a^2*b^3*c^3*d^2 + 60*I*A*B
*a^3*b^2*c^2*d^3 - 30*I*B^2*a^4*b*c*d^4 + 3*I*B^2*a^5*d^5 + 20*(9*I*A*B*a*b
^4*d^5 + (6*I*A*B + 5*I*B^2)*b^5*c*d^4)*x^4 + 10*((6*I*A*B + 11*I*B^2)*b^5*
c^2*d^3 + 18*(2*I*A*B + I*B^2)*a*b^4*c*d^4 + 9*(2*I*A*B - I*B^2)*a^2*b^3*d^
5)*x^3 + 10*(2*I*B^2*b^5*c^3*d^2 + 36*I*A*B*a^2*b^3*c*d^4 + 9*(2*I*A*B + 3*
I*B^2)*a*b^4*c^2*d^3 + 3*(2*I*A*B - 3*I*B^2)*a^3*b^2*d^5)*x^2 + 5*(-I*B^2*b
^5*c^4*d + 12*I*B^2*a*b^4*c^3*d^2 - 3*I*B^2*a^4*b*d^5 + 36*(I*A*B + I*B^2)*
a^2*b^3*c^2*d^3 + 24*(I*A*B - I*B^2)*a^3*b^2*c*d^4)*x)*log((b*x + a)*e/(d*x
 + c))^2 + 5*((-18*I*A^2 - 30*I*A*B - 19*I*B^2)*b^5*c^4*d + 108*(2*I*A^2 +
6*I*A*B + 7*I*B^2)*a*b^4*c^3*d^2 + 12*(36*I*A^2 - 39*I*A*B + 59*I*B^2)*a^2*
b^3*c^2*d^3 + 8*(-72*I*A^2 - 39*I*A*B - 157*I*B^2)*a^3*b^2*c*d^4 + 27*(-2*I
*A^2 + 6*I*A*B - 7*I*B^2)*a^4*b*d^5)*x + 6*(10*(18*I*A^2 + 12*I*A*B + 49*I*
B^2)*b^5*d^5*x^5 + 180*I*A^2*a^3*b^2*c^2*d^3 + 4*(3*I*A*B + I*B^2)*b^5*c^5
+ 45*(-2*I*A*B - I*B^2)*a*b^4*c^4*d + 360*(I*A*B + I*B^2)*a^2*b^3*c^3*d^2 +
 180*(-I*A*B + I*B^2)*a^4*b*c*d^4 + 9*(2*I*A*B - I*B^2)*a^5*d^5 + 10*(2*(18
*I*A^2 + 30*I*A*B + 55*I*B^2)*b^5*c*d^4 + 27*(2*I*A^2 + 5*I*B^2)*a*b^4*d^5)
*x^4 + 10*((18*I*A^2 + 66*I*A*B + 85*I*B^2)*b^5*c^2*d^3 + 54*(2*I*A^2 + 2*I
*A*B + 5*I*B^2)*a*b^4*c*d^4 + 27*(2*I*A^2 - 2*I*A*B + 5*I*B^2)*a^2*b^3*d^5)
*x^3 + 10*(2*(6*I*A*B + 11*I*B^2)*b^5*c^3*d^2 + 27*(2*I*A^2 + 6*I*A*B + 7*I
*B^2)*a*b^4*c^2*d^3 + 108*(I*A^2 + 2*I*B^2)*a^2*b^3*c*d^4 + 9*(2*I*A^2 - 6*
I*A*B + 7*I*B^2)*a^3*b^2*d^5)*x^2 + 5*((-6*I*A*B - 5*I*B^2)*b^5*c^4*d + 36*
(2*I*A*B + 3*I*B^2)*a*b^4*c^3*d^2 + 108*(I*A^2 + 2*I*A*B + 2*I*B^2)*a^2*b^3
```

```
*c^2*d^3 + 72*(I*A^2 - 2*I*A*B + 2*I*B^2)*a^3*b^2*c*d^4 + 9*(-2*I*A*B + 3*I
*B^2)*a^4*b*d^5)*x)*log((b*x + a)*e/(d*x + c)))/((b^9*c^6*d^2 - 6*a*b^8*c^5
*d^3 + 15*a^2*b^7*c^4*d^4 - 20*a^3*b^6*c^3*d^5 + 15*a^4*b^5*c^2*d^6 - 6*a^5
*b^4*c*d^7 + a^6*b^3*d^8)*g^4*x^5 + (2*b^9*c^7*d - 9*a*b^8*c^6*d^2 + 12*a^2
*b^7*c^5*d^3 + 5*a^3*b^6*c^4*d^4 - 30*a^4*b^5*c^3*d^5 + 33*a^5*b^4*c^2*d^6
- 16*a^6*b^3*c*d^7 + 3*a^7*b^2*d^8)*g^4*x^4 + (b^9*c^8 - 18*a^2*b^7*c^6*d^2
 + 52*a^3*b^6*c^5*d^3 - 60*a^4*b^5*c^4*d^4 + 24*a^5*b^4*c^3*d^5 + 10*a^6*b^
3*c^2*d^6 - 12*a^7*b^2*c*d^7 + 3*a^8*b*d^8)*g^4*x^3 + (3*a*b^8*c^8 - 12*a^2
*b^7*c^7*d + 10*a^3*b^6*c^6*d^2 + 24*a^4*b^5*c^5*d^3 - 60*a^5*b^4*c^4*d^4 +
 52*a^6*b^3*c^3*d^5 - 18*a^7*b^2*c^2*d^6 + a^9*d^8)*g^4*x^2 + (3*a^2*b^7*c^
8 - 16*a^3*b^6*c^7*d + 33*a^4*b^5*c^6*d^2 - 30*a^5*b^4*c^5*d^3 + 5*a^6*b^3*
c^4*d^4 + 12*a^7*b^2*c^3*d^5 - 9*a^8*b*c^2*d^6 + 2*a^9*c*d^7)*g^4*x + (a^3*
b^6*c^8 - 6*a^4*b^5*c^7*d + 15*a^5*b^4*c^6*d^2 - 20*a^6*b^3*c^5*d^3 + 15*a^
7*b^2*c^4*d^4 - 6*a^8*b*c^3*d^5 + a^9*c^2*d^6)*g^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^4*(I*d*x + I*
c)^3), x)
```

Mupad [**B**]
time = 18.95, size = 2500, normalized size = 2.94

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/((a*g + b*g*x)^4*(c*i + d*i*x)^3
),x)
```

[Out] ((36*A^2*b^4*c^4 - 54*A^2*a^4*d^4 - 27*B^2*a^4*d^4 + 8*B^2*b^4*c^4 + 54*A*B
*a^4*d^4 + 24*A*B*b^4*c^4 + 846*A^2*a^2*b^2*c^2*d^2 + 2033*B^2*a^2*b^2*c^2*
d^2 - 234*A^2*a*b^3*c^3*d + 486*A^2*a^3*b*c*d^3 - 127*B^2*a*b^3*c^3*d + 105
3*B^2*a^3*b*c*d^3 - 246*A*B*a*b^3*c^3*d - 1026*A*B*a^3*b*c*d^3 + 1914*A*B*a
^2*b^2*c^2*d^2)/(6*(a*d - b*c)) + (10*x^4*(18*A^2*b^4*d^4 + 49*B^2*b^4*d^4
+ 12*A*B*b^4*d^4))/(a*d - b*c) + (5*x*(54*A^2*a^3*b*d^4 + 189*B^2*a^3*b*d^4
 - 18*A^2*b^4*c^3*d - 19*B^2*b^4*c^3*d + 198*A^2*a*b^3*c^2*d^2 + 630*A^2*a^
2*b^2*c*d^3 + 737*B^2*a*b^3*c^2*d^2 + 1445*B^2*a^2*b^2*c*d^3 - 162*A*B*a^3*
b*d^4 - 30*A*B*b^4*c^3*d + 618*A*B*a*b^3*c^2*d^2 + 150*A*B*a^2*b^2*c*d^3))/
(6*(a*d - b*c)) + (5*x^2*(198*A^2*a^2*b^2*d^4 + 503*B^2*a^2*b^2*d^4 + 36*A^
2*b^4*c^2*d^2 + 170*B^2*b^4*c^2*d^2 - 84*A*B*a^2*b^2*d^4 + 132*A*B*b^4*c^2*
d^2 + 414*A^2*a*b^3*c*d^3 + 1091*B^2*a*b^3*c*d^3 + 384*A*B*a*b^3*c*d^3))/(3
*(a*d - b*c)) + (5*x^3*(90*A^2*a*b^3*d^4 + 233*B^2*a*b^3*d^4 + 54*A^2*b^4*c
*d^3 + 159*B^2*b^4*c*d^3 + 24*A*B*a*b^3*d^4 + 72*A*B*b^4*c*d^3))/(a*d - b*c
))/(x^5*(18*a^4*b^3*d^6*g^4*i^3 + 18*b^7*c^4*d^2*g^4*i^3 - 72*a*b^6*c^3*d^3
*g^4*i^3 - 72*a^3*b^4*c*d^5*g^4*i^3 + 108*a^2*b^5*c^2*d^4*g^4*i^3) + x*(54*
a^2*b^5*c^6*g^4*i^3 + 36*a^7*c*d^5*g^4*i^3 - 180*a^3*b^4*c^5*d*g^4*i^3 - 90
*a^6*b*c^2*d^4*g^4*i^3 + 180*a^4*b^3*c^4*d^2*g^4*i^3) + x^2*(18*a^7*d^6*g^4
*i^3 + 54*a*b^6*c^6*g^4*i^3 + 36*a^6*b*c*d^5*g^4*i^3 - 108*a^2*b^5*c^5*d*g^
4*i^3 - 90*a^3*b^4*c^4*d^2*g^4*i^3 + 360*a^4*b^3*c^3*d^3*g^4*i^3 - 270*a^5*
b^2*c^2*d^4*g^4*i^3) + x^3*(18*b^7*c^6*g^4*i^3 + 54*a^6*b*d^6*g^4*i^3 + 36*
a*b^6*c^5*d*g^4*i^3 - 108*a^5*b^2*c*d^5*g^4*i^3 - 270*a^2*b^5*c^4*d^2*g^4*i
^3 + 360*a^3*b^4*c^3*d^3*g^4*i^3 - 90*a^4*b^3*c^2*d^4*g^4*i^3) + x^4*(54*a^
5*b^2*d^6*g^4*i^3 + 36*b^7*c^5*d*g^4*i^3 - 90*a*b^6*c^4*d^2*g^4*i^3 - 180*a
^4*b^3*c*d^5*g^4*i^3 + 180*a^3*b^4*c^2*d^4*g^4*i^3) + 18*a^3*b^4*c^6*g^4*i^
3 + 18*a^7*c^2*d^4*g^4*i^3 - 72*a^4*b^3*c^5*d*g^4*i^3 - 72*a^6*b*c^3*d^3*g^
4*i^3 + 108*a^5*b^2*c^4*d^2*g^4*i^3) + log((e*(a + b*x))/(c + d*x))^2*((x*(
(5*B^2*(a*d + b*c)*(2*a*d + b*c))/(3*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d
)^2) - (5*B^2)/(6*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (5*B^2*a*b*c*d
)/(g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (20*B^2*a*b*c*d*(a*d + b*c)
)/(g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) + x^3*((5*B^2*b^
2*d^2)/(g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (20*B^2*b^2*d^2*(a*d +
 b*c))/(g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) + x^2*((5*B
^2*b*d*(a*d + b*c))/(g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (5*B^2*b*
d*(2*a*d + b*c))/(3*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (10*B^2*b^
2*d^3*((2*a*c*(a*d - b*c))/d + ((a*d + b*c)^2*(a*d - b*c))/(b*d^2)))/(g^4*i
^3*(a*d - b*c)^4*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - (B^2*(3*a*d + 2*b*c))/
(6*g^4*i^3*(a^2*b*d^3 + b^3*c^2*d - 2*a*b^2*c*d^2)) + (5*B^2*a*c*(2*a*d + b
*c))/(3*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (10*B^2*b^3*d^3*x^4)/(
g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (10*B^2*a^2*b*c^2*
d)/(g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)))/(b^2*d*x^5 + (x
^4*(3*a*b^2*d^2 + 2*b^3*c*d))/(b*d) + (a^3*c^2)/(b*d) + (x^2*(a^3*d^2 + 3*a
*b^2*c^2 + 6*a^2*b*c*d))/(b*d) + (x^3*(b^3*c^2 + 3*a^2*b*d^2 + 6*a*b^2*c*d)
)/(b*d) + (x*(3*a^2*b*c^2 + 2*a^3*c*d))/(b*d)) - (10*B*b^2*d^3*(3*A + B))/(
3*g^4*i^3*(a*d - b*c)^4*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) + (log((e*(a + b*

```
x))/(c + d*x))*(x^2*((10*b*d*(B^2*b*c - 7*B^2*a*d + 6*A*B*a*d + 3*A*B*b*c))
/(9*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) - (10*(a*d + b*c)*(2*B^2*b*d
 - 3*A*B*b*d))/(3*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (20*B*b^2*d^
3*(3*A + B)*((2*a*c*(a*d - b*c))/d + ((a*d + b*c)^2*(a*d - b*c))/(b*d^2)))/
(3*g^4*i^3*(a*d - b*c)^4*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - x^3*((10*b*d*(
2*B^2*b*d - 3*A*B*b*d))/(3*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) - (40
*B*b^2*d^2*(3*A + B)*(a*d + b*c))/(3*g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c
^2 - 2*a*b*c*d))) + x*((5*(B^2 - 6*A*B))/(18*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2
*a*b*c*d)) + (10*(a*d + b*c)*(B^2*b*c - 7*B^2*a*d + 6*A*B*a*d + 3*A*B*b*c))
/(9*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) - (10*a*c*(2*B^2*b*d - 3*A*B
*b*d))/(3*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (40*B*a*b*c*d*(3*A +
 B)*(a*d + b*c))/(3*g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)))
 - (4*B^2*b*c - 9*B^2*a*d + 18*A*B*a*d + 12*A*B*b*c)/(18*g^4*i^3*(a^2*b*d^3
 + b^3*c^2*d - 2*a*b^2*c*d^2)) + (10*a*c*(B^2*b*c - 7*B^2*a*d + 6*A*B*a*d +
 3*A*B*b*c))/(9*g^4*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (20*B*b^3*d^3*
x^4*(3*A + B))/(3*g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) +
(20*B*a^2*b*c^2*d*(3*A + B))/(3*g^4*i^3*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 -
2*a*b*c*d))))/(b^2*d*x^5 + (x^4*(3*a*b^2*d^2 + 2*b^3*c*d))/(b*d) + (a^3*c^2
)/(b*d) + (x^2*(a^3*d^2 + 3*a*b^2*c^2 + 6*a^2*b*c*d))/(b*d) + (x^3*(b^3*c^2
 + 3*a^2*b*d^2 + 6*a*b^2*c*d))/(b*d) + (x*(3*a^2*b*c^2 + 2*a^3*c*d))/(b*d))
 + (b^2*d^3*atan((b^2*d^3*(18*A^2 + 49*B^2 + 12*A*B)*(9*a^6*d^6*g^4*i^3 - 9
*b^6*c^6*g^4*i^3 + 36*a*b^5*c^5*d*g^4*i^3 - 36*...
```

3.108 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=223

$$-\frac{B(bc-ad)^4g^3inx}{20bd^3}+\frac{B(bc-ad)^3g^3in(a+bx)^2}{40b^2d^2}-\frac{B(bc-ad)^2g^3in(a+bx)^3}{60b^2d}+\frac{g^3i(a+bx)^4(c+dx)\left(A+B\,\mathrm{lo}\right.}{5b}$$

```
[Out] -1/20*B*(-a*d+b*c)^4*g^3*i*n*x/b/d^3+1/40*B*(-a*d+b*c)^3*g^3*i*n*(b*x+a)^2/
b^2/d^2-1/60*B*(-a*d+b*c)^2*g^3*i*n*(b*x+a)^3/b^2/d+1/5*g^3*i*(b*x+a)^4*(d*
x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b+1/20*(-a*d+b*c)*g^3*i*(b*x+a)^4*(A-B
*n+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2+1/20*B*(-a*d+b*c)^5*g^3*i*n*ln(d*x+c)/b
^2/d^4
```

Rubi [A]

time = 0.13, antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$, Rules used = {2559, 2547, 21, 45}

$$\frac{g^3i(a+bx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A-Bn\right)}{20b^2}+\frac{g^3i(a+bx)^4(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b}+\frac{Bg^3in(bc-ad)^5\log(c+dx)}{20b^2d^4}+\frac{Bg^3in(a+bx)^2(bc-ad)^3}{40b^2d^2}-\frac{Bg^3in(a+bx)^3(bc-ad)^2}{60b^2d}-\frac{Bg^3inx(bc-ad)^4}{20bd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -1/20*(B*(b*c - a*d)^4*g^3*i*n*x)/(b*d^3) + (B*(b*c - a*d)^3*g^3*i*n*(a + b
*x)^2)/(40*b^2*d^2) - (B*(b*c - a*d)^2*g^3*i*n*(a + b*x)^3)/(60*b^2*d) + (g
^3*i*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b) +
((b*c - a*d)*g^3*i*(a + b*x)^4*(A - B*n + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(20*b^2) + (B*(b*c - a*d)^5*g^3*i*n*Log[c + d*x])/(20*b^2*d^4)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2547

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*((A +
```

```
B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 1))), x] - Dist[B*n*((b*c - a*d)
/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ
[{a, b, c, d, e, f, g, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &
& NeQ[m, -2]
```

Rule 2559

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_)), x_Symbol] :> Simp[(f
 + g*x)^(m + 1)*(h + i*x)*((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 2
))), x] + Dist[i*((b*c - a*d)/(b*d*(m + 2))), Int[(f + g*x)^m*(A - B*n + B*
Log[e*((a + b*x)/(c + d*x))^n]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i
, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*
i, 0] && IGtQ[m, -2]
```

Rubi steps

$$\int (108c+108dx)(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int\left(\frac{108(bc-ad)(ag+bgx)^3\left(A+B\log\right.}{b}\right.$$

$$= \frac{(108(bc-ad))\int(ag+bgx)^3\left(A+B\log\right.}{b}$$

$$= \frac{27(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{b^2}$$

$$= \frac{27(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{b^2}$$

$$= \frac{27(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{b^2}$$

$$= -\frac{27B(bc-ad)^4g^3nx}{5bd^3}+\frac{27B(bc-ad)^3g}{10b^2d}$$

Mathematica [A]
time = 0.17, size = 269, normalized size = 1.21

$$\frac{g^3i\left(30(bc-ad)(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+24d(a+bx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-\frac{5B(bc-ad)^2n\left(6bd(bc-ad)^2x+3d^2(-bc+ad)(a+bx)^2+2d^3(a+bx)^3-6(bc-ad)^3\log(c+dx)\right)}{d^4}+\frac{2B(bc-ad)n\left(12bd(bc-ad)^3x-6d^2(bc-ad)^2(a+bx)^2+4d^3(bc-ad)(a+bx)^3-3d^4(a+bx)^4-12(bc-ad)^4\log(c+dx)\right)}{d^4}\right)}{120b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]),x]
```

```
[Out] (g^3*i*(30*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) +
 24*d*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - (5*B*(b*c - a*d)
^2*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a +
 b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/d^4 + (2*B*(b*c - a*d)*n*(12*b*d*(
b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b
*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]))/d^4))/(120*b^2)
```

Maple [F]
time = 0.09, size = 0, normalized size = 0.00

$$\int (bgx+ag)^3 (dix+ci) \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1109 vs. 2(209) = 418.
time = 0.32, size = 1109, normalized size = 4.97

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="maxima")
```

```
[Out] 1/5*I*B*b^3*d*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/5*I*A*b^3*
d*g^3*x^5 + 1/4*I*B*b^3*c*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) +
3/4*I*B*a*b^2*d*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/4*I*A*b^
3*c*g^3*x^4 + 3/4*I*A*a*b^2*d*g^3*x^4 + I*B*a*b^2*c*g^3*x^3*log((b*x/(d*x +
 c) + a/(d*x + c))^n*e) + I*B*a^2*b*d*g^3*x^3*log((b*x/(d*x + c) + a/(d*x +
 c))^n*e) + I*A*a*b^2*c*g^3*x^3 + I*A*a^2*b*d*g^3*x^3 + 3/2*I*B*a^2*b*c*g^3
*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/2*I*B*a^3*d*g^3*x^2*log((b*
x/(d*x + c) + a/(d*x + c))^n*e) + 3/2*I*A*a^2*b*c*g^3*x^2 + 1/2*I*A*a^3*d*g
^3*x^2 + 1/60*I*B*b^3*d*g^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c
)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3
+ 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/
24*I*B*b^3*c*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b
^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^
3*d^3)*x)/(b^3*d^3)) - 1/8*I*B*a*b^2*d*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^
4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*
d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*I*B*a*b^2*c*g^3*n*(2*a
^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2
*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/2*I*B*a^2*b*d*g^3*n*(2*a^3*log(b*x +
```

```
a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2)) - 3/2*I*B*a^2*b*c*g^3*n*(a^2*log(b*x + a)/b^2 - c^2*
log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 1/2*I*B*a^3*d*g^3*n*(a^2*log(b*x
+ a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + I*B*a^3*c*g^3*n*(a
*log(b*x + a)/b - c*log(d*x + c)/d) + I*B*a^3*c*g^3*x*log((b*x/(d*x + c) +
a/(d*x + c))^n*e) + I*A*a^3*c*g^3*x
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 635 vs. $2(209) = 418$.
time = 0.50, size = 635, normalized size = 2.85

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="fricas")
```

```
[Out] -1/120*(24*(-I*A - I*B)*b^5*d^5*g^3*x^5 + 6*(-5*I*B*a^4*b*c*d^4 + I*B*a^5*d
^5)*g^3*n*log((b*x + a)/b) + 6*(-I*B*b^5*c^5 + 5*I*B*a*b^4*c^4*d - 10*I*B*a
^2*b^3*c^3*d^2 + 10*I*B*a^3*b^2*c^2*d^3)*g^3*n*log((d*x + c)/d) + 6*((I*B*b
^5*c*d^4 - I*B*a*b^4*d^5)*g^3*n + 5*((-I*A - I*B)*b^5*c*d^4 + 3*(-I*A - I*B
)*a*b^4*d^5)*g^3)*x^4 + 2*((I*B*b^5*c^2*d^3 + 10*I*B*a*b^4*c*d^4 - 11*I*B*a
^2*b^3*d^5)*g^3*n + 60*((-I*A - I*B)*a*b^4*c*d^4 + (-I*A - I*B)*a^2*b^3*d^5
)*g^3)*x^3 + 3*((-I*B*b^5*c^3*d^2 + 5*I*B*a*b^4*c^2*d^3 + 5*I*B*a^2*b^3*c*d
^4 - 9*I*B*a^3*b^2*d^5)*g^3*n + 20*(3*(-I*A - I*B)*a^2*b^3*c*d^4 + (-I*A -
I*B)*a^3*b^2*d^5)*g^3)*x^2 + 6*(20*(-I*A - I*B)*a^3*b^2*c*d^4*g^3 + (I*B*b^
5*c^4*d - 5*I*B*a*b^4*c^3*d^2 + 10*I*B*a^2*b^3*c^2*d^3 - 5*I*B*a^3*b^2*c*d^
4 - I*B*a^4*b*d^5)*g^3*n)*x + 6*(-4*I*B*b^5*d^5*g^3*n*x^5 - 20*I*B*a^3*b^2*
c*d^4*g^3*n*x + 5*(-I*B*b^5*c*d^4 - 3*I*B*a*b^4*d^5)*g^3*n*x^4 + 20*(-I*B*a
*b^4*c*d^4 - I*B*a^2*b^3*d^5)*g^3*n*x^3 + 10*(-3*I*B*a^2*b^3*c*d^4 - I*B*a^
3*b^2*d^5)*g^3*n*x^2)*log((b*x + a)/(d*x + c)))/(b^2*d^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3847 vs. $2(209) = 418$.
time = 3.50, size = 3847, normalized size = 17.25

Too large to display

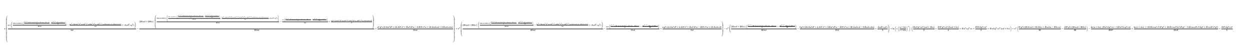
Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")

[Out] -1/120*(6*(I*B*b^9*c^6*g^3*n - 6*I*B*a*b^8*c^5*d*g^3*n + 5*(-I*b*x - I*a)*B*b^8*c^6*d*g^3*n/(d*x + c) + 15*I*B*a^2*b^7*c^4*d^2*g^3*n + 30*(I*b*x + I*a)*B*a*b^7*c^5*d^2*g^3*n/(d*x + c) + 10*I*(b*x + a)^2*B*b^7*c^6*d^2*g^3*n/(d*x + c)^2 - 20*I*B*a^3*b^6*c^3*d^3*g^3*n + 75*(-I*b*x - I*a)*B*a^2*b^6*c^4*d^3*g^3*n/(d*x + c) - 60*I*(b*x + a)^2*B*a*b^6*c^5*d^3*g^3*n/(d*x + c)^2 - 10*I*(b*x + a)^3*B*b^6*c^6*d^3*g^3*n/(d*x + c)^3 + 15*I*B*a^4*b^5*c^2*d^4*g^3*n + 100*(I*b*x + I*a)*B*a^3*b^5*c^3*d^4*g^3*n/(d*x + c) + 150*I*(b*x + a)^2*B*a^2*b^5*c^4*d^4*g^3*n/(d*x + c)^2 + 60*I*(b*x + a)^3*B*a*b^5*c^5*d^4*g^3*n/(d*x + c)^3 - 6*I*B*a^5*b^4*c*d^5*g^3*n + 75*(-I*b*x - I*a)*B*a^4*b^4*c^2*d^5*g^3*n/(d*x + c) - 200*I*(b*x + a)^2*B*a^3*b^4*c^3*d^5*g^3*n/(d*x + c)^2 - 150*I*(b*x + a)^3*B*a^2*b^4*c^4*d^5*g^3*n/(d*x + c)^3 + I*B*a^6*b^3*d^6*g^3*n + 30*(I*b*x + I*a)*B*a^5*b^3*c*d^6*g^3*n/(d*x + c) + 150*I*(b*x + a)^2*B*a^4*b^3*c^2*d^6*g^3*n/(d*x + c)^2 + 200*I*(b*x + a)^3*B*a^3*b^3*c^3*d^6*g^3*n/(d*x + c)^3 + 5*(-I*b*x - I*a)*B*a^6*b^2*d^7*g^3*n/(d*x + c) - 60*I*(b*x + a)^2*B*a^5*b^2*c*d^7*g^3*n/(d*x + c)^2 - 150*I*(b*x + a)^3*B*a^4*b^2*c^2*d^7*g^3*n/(d*x + c)^3 + 10*I*(b*x + a)^2*B*a^6*b*d^8*g^3*n/(d*x + c)^2 + 60*I*(b*x + a)^3*B*a^5*b*c*d^8*g^3*n/(d*x + c)^3 - 10*I*(b*x + a)^3*B*a^6*d^9*g^3*n/(d*x + c)^3)*log((b*x + a)/(d*x + c))/(b^5*d^4 - 5*(b*x + a)*b^4*d^5/(d*x + c) + 10*(b*x + a)^2*b^3*d^6/(d*x + c)^2 - 10*(b*x + a)^3*b^2*d^7/(d*x + c)^3 + 5*(b*x + a)^4*b*d^8/(d*x + c)^4 - (b*x + a)^5*d^9/(d*x + c)^5) - (-5*I*B*b^10*c^6*g^3*n + 30*I*B*a*b^9*c^5*d*g^3*n - 19*(-I*b*x - I*a)*B*b^9*c^6*d*g^3*n/(d*x + c) - 75*I*B*a^2*b^8*c^4*d^2*g^3*n - 114*(I*b*x + I*a)*B*a*b^8*c^5*d^2*g^3*n/(d*x + c) - 23*I*(b*x + a)^2*B*b^8*c^6*d^2*g^3*n/(d*x + c)^2 + 100*I*B*a^3*b^7*c^3*d^3*g^3*n - 285*(-I*b*x - I*a)*B*a^2*b^7*c^4*d^3*g^3*n/(d*x + c) + 138*I*(b*x + a)^2*B*a*b^7*c^5*d^3*g^3*n/(d*x + c)^2 + 3*I*(b*x + a)^3*B*b^7*c^6*d^3*g^3*n/(d*x + c)^3 - 75*I*B*a^4*b^6*c^2*d^4*g^3*n - 380*(I*b*x + I*a)*B*a^3*b^6*c^3*d^4*g^3*n/(d*x + c) - 345*I*(b*x + a)^2*B*a^2*b^6*c^4*d^4*g^3*n/(d*x + c)^2 - 18*I*(b*x + a)^3*B*a*b^6*c^5*d^4*g^3*n/(d*x + c)^3 + 6*I*(b*x + a)^4*B*b^6*c^6*d^4*g^3*n/(d*x + c)^4 + 30*I*B*a^5*b^5*c*d^5*g^3*n - 285*(-I*b*x - I*a)*B*a^4*b^5*c^2*d^5*g^3*n/(d*x + c) + 460*I*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g^3*n/(d*x + c)^2 + 45*I*(b*x + a)^3*B*a^2*b^5*c^4*d^5*g^3*n/(d*x + c)^3 - 36*I*(b*x + a)^4*B*a*b^5*c^5*d^5*g^3*n/(d*x + c)^4 - 5*I*B*a^6*b^4*d^6*g^3*n - 114*(I*b*x + I*a)*B*a^5*b^4*c*d^6*g^3*n/(d*x + c) - 345*I*(b*x + a)^2*B*a^4*b^4*c^2*d^6*g^3*n/(d*x + c)^2 - 60*I*(b*x + a)^3*B*a^3*b^4*c^3*d^6*g^3*n/(d*x + c)^3 + 90*I*(b*x + a)^4*B*a^2*b^4*c^4*d^6*g^3*n/(d*x + c)^4 - 19*(-I*b*x - I*a)*B*a^6*b^3*d^7*g^3*n/(d*x + c) + 138*I*(b*x + a)^2*B*a^5*b^3*c*d^7*g^3*n/(d*x + c)^2 + 45*I*(b*x + a)^3*B*a^4*b^3*c^2*d^7*g^3*n/(d*x + c)^3 - 120*I*(b*x + a)^4*B*a^3*b^3*c^3*d^7*g^3*n/(d*x + c)^4 - 23*I*(b*x + a)^2*B*a^6*b^2*d^8*g^3*n/(d*x + c)^2 - 18*I*(b*x + a)^3*B*a^5*b^2*c*d^8*g^3*n/(d*x + c)^3 + 90*I*(b*

x + a)^4*B*a^4*b^2*c^2*d^8*g^3*n/(d*x + c)^4 + 3*I*(b*x + a)^3*B*a^6*b*d^9*
g^3*n/(d*x + c)^3 - 36*I*(b*x + a)^4*B*a^5*b*c*d^9*g^3*n/(d*x + c)^4 + 6*I*
(b*x + a)^4*B*a^6*d^10*g^3*n/(d*x + c)^4 - 6*I*A*b^10*c^6*g^3 - 6*I*B*b^10*
c^6*g^3 + 36*I*A*a*b^9*c^5*d*g^3 + 36*I*B*a*b^9*c^5*d*g^3 - 30*(-I*b*x - I*
a)*A*b^9*c^6*d*g^3/(d*x + c) - 30*(-I*b*x - I*a)*B*b^9*c^6*d*g^3/(d*x + c)
- 90*I*A*a^2*b^8*c^4*d^2*g^3 - 90*I*B*a^2*b^8*c^4*d^2*g^3 - 180*(I*b*x + I*
a)*A*a*b^8*c^5*d^2*g^3/(d*x + c) - 180*(I*b*x + I*a)*B*a*b^8*c^5*d^2*g^3/(d
*x + c) - 60*I*(b*x + a)^2*A*b^8*c^6*d^2*g^3/(d*x + c)^2 - 60*I*(b*x + a)^2
*B*b^8*c^6*d^2*g^3/(d*x + c)^2 + 120*I*A*a^3*b^7*c^3*d^3*g^3 + 120*I*B*a^3*
b^7*c^3*d^3*g^3 - 450*(-I*b*x - I*a)*A*a^2*b^7*c^4*d^3*g^3/(d*x + c) - 450*
(-I*b*x - I*a)*B*a^2*b^7*c^4*d^3*g^3/(d*x + c) + 360*I*(b*x + a)^2*A*a*b^7*
c^5*d^3*g^3/(d*x + c)^2 + 360*I*(b*x + a)^2*B*a*b^7*c^5*d^3*g^3/(d*x + c)^2
 + 60*I*(b*x + a)^3*A*b^7*c^6*d^3*g^3/(d*x + c)^3 + 60*I*(b*x + a)^3*B*b^7*
c^6*d^3*g^3/(d*x + c)^3 - 90*I*A*a^4*b^6*c^2*d^4*g^3 - 90*I*B*a^4*b^6*c^2*d
^4*g^3 - 600*(I*b*x + I*a)*A*a^3*b^6*c^3*d^4*g^3/(d*x + c) - 600*(I*b*x + I
*a)*B*a^3*b^6*c^3*d^4*g^3/(d*x + c) - 900*I*(b*x + a)^2*A*a^2*b^6*c^4*d^4*g
^3/(d*x + c)^2 - 900*I*(b*x + a)^2*B*a^2*b^6*c^4*d^4*g^3/(d*x + c)^2 - 360*
I*(b*x + a)^3*A*a*b^6*c^5*d^4*g^3/(d*x + c)^3 - 360*I*(b*x + a)^3*B*a*b^6*c
^5*d^4*g^3/(d*x + c)^3 + 36*I*A*a^5*b^5*c*d^5*g^3 + 36*I*B*a^5*b^5*c*d^5*g^
3 - 450*(-I*b*x - I*a)*A*a^4*b^5*c^2*d^5*g^3/(d*x + c) - 450*(-I*b*x - I*a)
*B*a^4*b^5*c^2*d^5*g^3/(d*x + c) + 1200*I*(b*x + a)^2*A*a^3*b^5*c^3*d^5*g^3
/(d*x + c)^2 + 1200*I*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g^3/(d*x + c)^2 + 900*I
*(b*x + a)^3*A*a^2*b^5*c^4*d^5*g^3/(d*x + c)^3 + 900*I*(b*x + a)^3*B*a^2*b^
5*c^4*d^5*g^3/(d*x + c)^3 - 6*I*A*a^6*b^4*d^6*g^3 - 6*I*B*a^6*b^4*d^6*g^3 -
 180*(I*b*x + I*a)*A*a^5*b^4*c*d^6*g^3/(d*x + c) - 180*(I*b*x + I*a)*B*a^5*
b^4*c*d^6*g^3/(d*x + c) - 900*I*(b*x + a)^2*A*a^4*b^4*c^2*d^6*g^3/(d*x + c)
^2 - 900*I*(b*x + a)^2*B*a^4*b^4*c^2*d^6*g^3/(d...

Mupad [B]
time = 5.62, size = 1237, normalized size = 5.55



Verification of antiderivative is not currently implemented for this CAS.

[In] int((a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)

[Out] x*((a*c*(((20*a*d + 20*b*c)*((b^2*g^3*i*(20*A*a*d + 10*A*b*c + B*a*d*n - B*
b*c*n))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/20))/(20*b*d) - (b*g^3*i*(24*A*
a^2*d^2 + 4*A*b^2*c^2 + 3*B*a^2*d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d - 2*B*a*
b*c*d*n))/(4*d) + A*a*b^2*c*g^3*i))/(b*d) - ((20*a*d + 20*b*c)*(((20*a*d +
20*b*c)*(((20*a*d + 20*b*c)*((b^2*g^3*i*(20*A*a*d + 10*A*b*c + B*a*d*n - B*
b*c*n))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/20))/(20*b*d) - (b*g^3*i*(24*A*
a^2*d^2 + 4*A*b^2*c^2 + 3*B*a^2*d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d - 2*B*a*
b*c*d*n))/(4*d) + A*a*b^2*c*g^3*i))/(20*b*d) - (a*c*((b^2*g^3*i*(20*A*a*d +
 10*A*b*c + B*a*d*n - B*b*c*n))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/20))/(b

```
*d) + (a*g^3*i*(4*A*a^2*d^2 + 4*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 12*
A*a*b*c*d))/d))/(20*b*d) + (a^2*g^3*i*(2*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d
^2*n - 3*B*b^2*c^2*n + 16*A*a*b*c*d + 2*B*a*b*c*d*n))/(2*b*d)) + x^2*(((20*
a*d + 20*b*c)*(((20*a*d + 20*b*c)*((b^2*g^3*i*(20*A*a*d + 10*A*b*c + B*a*d*
n - B*b*c*n))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/20))/(20*b*d) - (b*g^3*i*
(24*A*a^2*d^2 + 4*A*b^2*c^2 + 3*B*a^2*d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d -
2*B*a*b*c*d*n))/(4*d) + A*a*b^2*c*g^3*i))/(40*b*d) - (a*c*((b^2*g^3*i*(20*A
*a*d + 10*A*b*c + B*a*d*n - B*b*c*n))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/2
0))/(2*b*d) + (a*g^3*i*(4*A*a^2*d^2 + 4*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2
*n + 12*A*a*b*c*d))/(2*d)) - x^3*(((20*a*d + 20*b*c)*((b^2*g^3*i*(20*A*a*d
+ 10*A*b*c + B*a*d*n - B*b*c*n))/5 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/20))/(
60*b*d) - (b*g^3*i*(24*A*a^2*d^2 + 4*A*b^2*c^2 + 3*B*a^2*d^2*n - B*b^2*c^2*
n + 32*A*a*b*c*d - 2*B*a*b*c*d*n))/(12*d) + (A*a*b^2*c*g^3*i)/3) + log(e*((
a + b*x)/(c + d*x))^n)*((B*a^2*g^3*i*x^2*(a*d + 3*b*c))/2 + (B*b^2*g^3*i*x^
4*(3*a*d + b*c))/4 + B*a^3*c*g^3*i*x + (B*b^3*d*g^3*i*x^5)/5 + B*a*b*g^3*i*
x^3*(a*d + b*c)) + x^4*((b^2*g^3*i*(20*A*a*d + 10*A*b*c + B*a*d*n - B*b*c*n
))/20 - (A*b^2*g^3*i*(20*a*d + 20*b*c))/80) - (log(a + b*x)*(B*a^5*d*g^3*i*
n - 5*B*a^4*b*c*g^3*i*n))/(20*b^2) + (log(c + d*x)*(B*b^3*c^5*g^3*i*n - 10*
B*a^3*c^2*d^3*g^3*i*n - 5*B*a*b^2*c^4*d*g^3*i*n + 10*B*a^2*b*c^3*d^2*g^3*i*
n))/(20*d^4) + (A*b^3*d*g^3*i*x^5)/5
```

3.109 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=190

$$\frac{B(bc-ad)^3g^2inx}{12bd^2}-\frac{B(bc-ad)^2g^2in(a+bx)^2}{24b^2d}+\frac{g^2i(a+bx)^3(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b}+\frac{(bc-ad)g^2i}{}$$

```
[Out] 1/12*B*(-a*d+b*c)^3*g^2*i*n*x/b/d^2-1/24*B*(-a*d+b*c)^2*g^2*i*n*(b*x+a)^2/b
^2/d+1/4*g^2*i*(b*x+a)^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b+1/12*(-a
*d+b*c)*g^2*i*(b*x+a)^3*(A-B*n+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2-1/12*B*(-a*
d+b*c)^4*g^2*i*n*ln(d*x+c)/b^2/d^3
```

Rubi [A]
time = 0.11, antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$, Rules used = {2559, 2547, 21, 45}

$$\frac{g^2i(a+bx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A-Bn\right)}{12b^2}+\frac{g^2i(a+bx)^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4b}-\frac{Bg^2in(bc-ad)^4\log(c+dx)}{12b^2d^3}-\frac{Bg^2in(a+bx)^2(bc-ad)^2}{24b^2d}+\frac{Bg^2inx(bc-ad)^3}{12bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (B*(b*c - a*d)^3*g^2*i*n*x)/(12*b*d^2) - (B*(b*c - a*d)^2*g^2*i*n*(a + b*x)
^2)/(24*b^2*d) + (g^2*i*(a + b*x)^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(4*b) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A - B*n + B*Log[e*((a +
b*x)/(c + d*x))^n]))/(12*b^2) - (B*(b*c - a*d)^4*g^2*i*n*Log[c + d*x])/(12*
b^2*d^3)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2547

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*((A +
```

```
B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 1))), x] - Dist[B*n*((b*c - a*d)
/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ
[{a, b, c, d, e, f, g, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &
& NeQ[m, -2]
```

Rule 2559

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_)), x_Symbol] :> Simp[(f
 + g*x)^(m + 1)*(h + i*x)*((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 2
))), x] + Dist[i*((b*c - a*d)/(b*d*(m + 2))), Int[(f + g*x)^m*(A - B*n + B*
Log[e*((a + b*x)/(c + d*x))^n]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i
, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*
i, 0] && IGtQ[m, -2]
```

Rubi steps

$$\int (109c+109dx)(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx = \int \left(\frac{109(bc-ad)(ag+bgx)^2\left(A+B\log\left(\right.\right.}{b}\right.$$

$$= \frac{(109(bc-ad))\int (ag+bgx)^2\left(A+B\log\left(e\right.\right.}{b}$$

$$= \frac{109(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{3b^2}$$

$$= \frac{109(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{3b^2}$$

$$= \frac{109(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{3b^2}$$

$$= \frac{109B(bc-ad)^3g^2nx}{12bd^2} - \frac{109B(bc-ad)^2g^2}{24b^2d}$$

Mathematica [A]
time = 0.13, size = 225, normalized size = 1.18

$$\frac{g^2i\left(8(bc-ad)(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+6d(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+\frac{4B(bc-ad)^2n\left(2bd(bc-ad)x-d^2(a+bx)^2-2(bc-ad)^2\log(c+dx)\right)}{d^3}-\frac{B(bc-ad)n\left(6bd(bc-ad)^2x+3d^2(-bc+ad)(a+bx)^2+2d^3(a+bx)^3-6(bc-ad)^3\log(c+dx)\right)}{d^3}\right)}{24b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]),x]
```

```
[Out] (g^2*i*(8*(b*c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) +
6*d*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (4*B*(b*c - a*d)^2
*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]))/
d^3 - (B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b
*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/d^3))/(24*b^2)
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int (bgx+ag)^2 (dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 733 vs. 2(179) = 358.
time = 0.29, size = 733, normalized size = 3.86

$$\frac{1}{4}iBb^2dg^2x^4\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)+\frac{1}{4}iAb^2dg^2x^4+\frac{1}{3}iBb^2cg^2x^3\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)+\frac{2}{3}iBabdg^2x^3\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)+\frac{1}{3}iAb^2cg^2x^3+\frac{2}{3}iAabdg^2x^3+iBabcg^2x^2\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)+\frac{1}{2}iBa^2dg^2x^2\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)+iAabcg^2x^2+\frac{1}{2}iAa^2dg^2x^2-\frac{1}{24}iBb^2dg^2n\left(\frac{6a^4\log(bx+a)}{b^4}-\frac{6c^4\log(dx+c)}{d^4}+\frac{2(b^3cd^2-ab^2d^3)x^3-3(b^3c^2d-a^2bd^3)x^2+6(b^3c^3-a^3d^3)x}{b^3d^3}\right)+\frac{1}{6}iBb^2cg^2n\left(\frac{2a^3\log(bx+a)}{b^3}-\frac{2c^3\log(dx+c)}{d^3}-\frac{(b^2cd-abd^2)x^2-2(b^2c^2-a^2d^2)x}{b^2d^2}\right)+\frac{1}{3}iBabdg^2n\left(\frac{2a^3\log(bx+a)}{b^3}-\frac{2c^3\log(dx+c)}{d^3}-\frac{(b^2cd-abd^2)x^2-2(b^2c^2-a^2d^2)x}{b^2d^2}\right)-iBabcg^2n\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)-\frac{1}{2}iBa^2dg^2n\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)+iBa^2cg^2n\left(\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)+iBa^2cg^2x\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)+iAa^2cg^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="maxima")
```

```
[Out] 1/4*I*B*b^2*d*g^2*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/4*I*A*b^2*
d*g^2*x^4 + 1/3*I*B*b^2*c*g^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) +
2/3*I*B*a*b*d*g^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/3*I*A*b^2*
c*g^2*x^3 + 2/3*I*A*a*b*d*g^2*x^3 + I*B*a*b*c*g^2*x^2*log((b*x/(d*x + c) +
a/(d*x + c))^n*e) + 1/2*I*B*a^2*d*g^2*x^2*log((b*x/(d*x + c) + a/(d*x + c))
^n*e) + I*A*a*b*c*g^2*x^2 + 1/2*I*A*a^2*d*g^2*x^2 - 1/24*I*B*b^2*d*g^2*n*(6
*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)
*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))
+ 1/6*I*B*b^2*c*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/3*I*B*a*b*
d*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*
d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - I*B*a*b*c*g^2*n*(a^2*log(b
*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 1/2*I*B*a^2*d*g
^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) +
I*B*a^2*c*g^2*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + I*B*a^2*c*g^2*x*log
((b*x/(d*x + c) + a/(d*x + c))^n*e) + I*A*a^2*c*g^2*x
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 467 vs. 2(179) = 358.

time = 0.43, size = 467, normalized size = 2.46

$$-\frac{6\,(-i\,A-i\,B)b^4d^4g^2x^4+2\,(-4i\,Ba^3bcd^3+i\,Ba^4d^4)g^2n\log\left(\frac{bx+a}{b}\right)+2\,(i\,Bb^4c^4-4i\,Bab^3c^3d+6i\,Ba^2b^2c^2d^2)g^2n\log\left(\frac{dx+c}{d}\right)+2\,((i\,Bb^4cd^3-i\,Bab^3d^4)g^2n+4\,((-i\,A-i\,B)b^4cd^3+2\,(-i\,A-i\,B)ab^3d^4)g^2)x^3-((-i\,Bb^4c^2d^2-4i\,Bab^3cd^3+5i\,Ba^2b^2d^4)g^2n-12\,(2\,(-i\,A-i\,B)ab^3cd^3+(-i\,A-i\,B)a^2b^2d^4)g^2)x^2+2\,(12\,(-i\,A-i\,B)a^2b^2cd^3g^2+(-i\,Bb^4c^3d+4i\,Bab^3c^2d^2-2i\,Ba^2b^2cd^3-i\,Ba^3bd^4)g^2n)x+2\,(-3i\,Bb^4d^4g^2nx^4-12i\,Ba^2b^2cd^3g^2nx+4\,(-i\,Bb^4cd^3-2i\,Bab^3d^4)g^2nx^3+6\,(-2i\,Bab^3cd^3-i\,Ba^2b^2d^4)g^2nx^2)\log\left(\frac{bx+a}{dx+c}\right)}{24\,b^2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="fricas")
```

```
[Out] -1/24*(6*(-I*A - I*B)*b^4*d^4*g^2*x^4 + 2*(-4*I*B*a^3*b*c*d^3 + I*B*a^4*d^4
)*g^2*n*log((b*x + a)/b) + 2*(I*B*b^4*c^4 - 4*I*B*a*b^3*c^3*d + 6*I*B*a^2*b
^2*c^2*d^2)*g^2*n*log((d*x + c)/d) + 2*((I*B*b^4*c*d^3 - I*B*a*b^3*d^4)*g^2
*n + 4*((-I*A - I*B)*b^4*c*d^3 + 2*(-I*A - I*B)*a*b^3*d^4)*g^2)*x^3 - ((-I*
B*b^4*c^2*d^2 - 4*I*B*a*b^3*c*d^3 + 5*I*B*a^2*b^2*d^4)*g^2*n - 12*(2*(-I*A
- I*B)*a*b^3*c*d^3 + (-I*A - I*B)*a^2*b^2*d^4)*g^2)*x^2 + 2*(12*(-I*A - I*B
)*a^2*b^2*c*d^3*g^2 + (-I*B*b^4*c^3*d + 4*I*B*a*b^3*c^2*d^2 - 2*I*B*a^2*b^2
*c*d^3 - I*B*a^3*b*d^4)*g^2*n)*x + 2*(-3*I*B*b^4*d^4*g^2*n*x^4 - 12*I*B*a^2
*b^2*c*d^3*g^2*n*x + 4*(-I*B*b^4*c*d^3 - 2*I*B*a*b^3*d^4)*g^2*n*x^3 + 6*(-2
*I*B*a*b^3*c*d^3 - I*B*a^2*b^2*d^4)*g^2*n*x^2)*log((b*x + a)/(d*x + c)))/(b
^2*d^3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2522 vs. 2(179) = 358.
time = 4.67, size = 2522, normalized size = 13.27

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="giac")
```

```
[Out] 1/24*(2*(I*B*b^7*c^5*g^2*n - 5*I*B*a*b^6*c^4*d*g^2*n - 4*(I*b*x + I*a)*B*b^
6*c^5*d*g^2*n/(d*x + c) + 10*I*B*a^2*b^5*c^3*d^2*g^2*n - 20*(-I*b*x - I*a)*
B*a*b^5*c^4*d^2*g^2*n/(d*x + c) + 6*I*(b*x + a)^2*B*b^5*c^5*d^2*g^2*n/(d*x
+ c)^2 - 10*I*B*a^3*b^4*c^2*d^3*g^2*n - 40*(I*b*x + I*a)*B*a^2*b^4*c^3*d^3*
g^2*n/(d*x + c) - 30*I*(b*x + a)^2*B*a*b^4*c^4*d^3*g^2*n/(d*x + c)^2 + 5*I*
```

B*a^4*b^3*c*d^4*g^2*n - 40*(-I*b*x - I*a)*B*a^3*b^3*c^2*d^4*g^2*n/(d*x + c)
 + 60*I*(b*x + a)^2*B*a^2*b^3*c^3*d^4*g^2*n/(d*x + c)^2 - I*B*a^5*b^2*d^5*g
^2*n - 20*(I*b*x + I*a)*B*a^4*b^2*c*d^5*g^2*n/(d*x + c) - 60*I*(b*x + a)^2*
B*a^3*b^2*c^2*d^5*g^2*n/(d*x + c)^2 - 4*(-I*b*x - I*a)*B*a^5*b*d^6*g^2*n/(d
*x + c) + 30*I*(b*x + a)^2*B*a^4*b*c*d^6*g^2*n/(d*x + c)^2 - 6*I*(b*x + a)^
2*B*a^5*d^7*g^2*n/(d*x + c)^2)*log((b*x + a)/(d*x + c))/(b^4*d^3 - 4*(b*x +
 a)*b^3*d^4/(d*x + c) + 6*(b*x + a)^2*b^2*d^5/(d*x + c)^2 - 4*(b*x + a)^3*b
*d^6/(d*x + c)^3 + (b*x + a)^4*d^7/(d*x + c)^4) + (I*B*b^8*c^5*g^2*n - 5*I*
B*a*b^7*c^4*d*g^2*n - 2*(I*b*x + I*a)*B*b^7*c^5*d*g^2*n/(d*x + c) + 10*I*B*
a^2*b^6*c^3*d^2*g^2*n - 10*(-I*b*x - I*a)*B*a*b^6*c^4*d^2*g^2*n/(d*x + c) -
 I*(b*x + a)^2*B*b^6*c^5*d^2*g^2*n/(d*x + c)^2 - 10*I*B*a^3*b^5*c^2*d^3*g^2
n - 20(I*b*x + I*a)*B*a^2*b^5*c^3*d^3*g^2*n/(d*x + c) + 5*I*(b*x + a)^2*B
*a*b^5*c^4*d^3*g^2*n/(d*x + c)^2 + 2*I*(b*x + a)^3*B*b^5*c^5*d^3*g^2*n/(d*x
 + c)^3 + 5*I*B*a^4*b^4*c*d^4*g^2*n - 20*(-I*b*x - I*a)*B*a^3*b^4*c^2*d^4*g
^2*n/(d*x + c) - 10*I*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^2*n/(d*x + c)^2 - 10*
I*(b*x + a)^3*B*a*b^4*c^4*d^4*g^2*n/(d*x + c)^3 - I*B*a^5*b^3*d^5*g^2*n - 1
0*(I*b*x + I*a)*B*a^4*b^3*c*d^5*g^2*n/(d*x + c) + 10*I*(b*x + a)^2*B*a^3*b^
3*c^2*d^5*g^2*n/(d*x + c)^2 + 20*I*(b*x + a)^3*B*a^2*b^3*c^3*d^5*g^2*n/(d*x
 + c)^3 - 2*(-I*b*x - I*a)*B*a^5*b^2*d^6*g^2*n/(d*x + c) - 5*I*(b*x + a)^2*
B*a^4*b^2*c*d^6*g^2*n/(d*x + c)^2 - 20*I*(b*x + a)^3*B*a^3*b^2*c^2*d^6*g^2*
n/(d*x + c)^3 + I*(b*x + a)^2*B*a^5*b*d^7*g^2*n/(d*x + c)^2 + 10*I*(b*x + a
)^3*B*a^4*b*c*d^7*g^2*n/(d*x + c)^3 - 2*I*(b*x + a)^3*B*a^5*d^8*g^2*n/(d*x
+ c)^3 + 2*I*A*b^8*c^5*g^2 + 2*I*B*b^8*c^5*g^2 - 10*I*A*a*b^7*c^4*d*g^2 - 1
0*I*B*a*b^7*c^4*d*g^2 - 8*(I*b*x + I*a)*A*b^7*c^5*d*g^2/(d*x + c) - 8*(I*b*
x + I*a)*B*b^7*c^5*d*g^2/(d*x + c) + 20*I*A*a^2*b^6*c^3*d^2*g^2 + 20*I*B*a^
2*b^6*c^3*d^2*g^2 - 40*(-I*b*x - I*a)*A*a*b^6*c^4*d^2*g^2/(d*x + c) - 40*(-
I*b*x - I*a)*B*a*b^6*c^4*d^2*g^2/(d*x + c) + 12*I*(b*x + a)^2*A*b^6*c^5*d^2
*g^2/(d*x + c)^2 + 12*I*(b*x + a)^2*B*b^6*c^5*d^2*g^2/(d*x + c)^2 - 20*I*A*
a^3*b^5*c^2*d^3*g^2 - 20*I*B*a^3*b^5*c^2*d^3*g^2 - 80*(I*b*x + I*a)*A*a^2*b
^5*c^3*d^3*g^2/(d*x + c) - 80*(I*b*x + I*a)*B*a^2*b^5*c^3*d^3*g^2/(d*x + c)
 - 60*I*(b*x + a)^2*A*a*b^5*c^4*d^3*g^2/(d*x + c)^2 - 60*I*(b*x + a)^2*B*a*
b^5*c^4*d^3*g^2/(d*x + c)^2 + 10*I*A*a^4*b^4*c*d^4*g^2 + 10*I*B*a^4*b^4*c*d
^4*g^2 - 80*(-I*b*x - I*a)*A*a^3*b^4*c^2*d^4*g^2/(d*x + c) - 80*(-I*b*x - I
*a)*B*a^3*b^4*c^2*d^4*g^2/(d*x + c) + 120*I*(b*x + a)^2*A*a^2*b^4*c^3*d^4*g
^2/(d*x + c)^2 + 120*I*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^2/(d*x + c)^2 - 2*I*
A*a^5*b^3*d^5*g^2 - 2*I*B*a^5*b^3*d^5*g^2 - 40*(I*b*x + I*a)*A*a^4*b^3*c*d^
5*g^2/(d*x + c) - 40*(I*b*x + I*a)*B*a^4*b^3*c*d^5*g^2/(d*x + c) - 120*I*(b
*x + a)^2*A*a^3*b^3*c^2*d^5*g^2/(d*x + c)^2 - 120*I*(b*x + a)^2*B*a^3*b^3*c
^2*d^5*g^2/(d*x + c)^2 - 8*(-I*b*x - I*a)*A*a^5*b^2*d^6*g^2/(d*x + c) - 8*(
-I*b*x - I*a)*B*a^5*b^2*d^6*g^2/(d*x + c) + 60*I*(b*x + a)^2*A*a^4*b^2*c*d^
6*g^2/(d*x + c)^2 + 60*I*(b*x + a)^2*B*a^4*b^2*c*d^6*g^2/(d*x + c)^2 - 12*I
*(b*x + a)^2*A*a^5*b*d^7*g^2/(d*x + c)^2 - 12*I*(b*x + a)^2*B*a^5*b*d^7*g^2
/(d*x + c)^2)/(b^5*d^3 - 4*(b*x + a)*b^4*d^4/(d*x + c) + 6*(b*x + a)^2*b^3*
d^5/(d*x + c)^2 - 4*(b*x + a)^3*b^2*d^6/(d*x + c)^3 + (b*x + a)^4*b*d^7/(d*
x + c)^4) + 2*(I*B*b^5*c^5*g^2*n - 5*I*B*a*b^4*c^4*d*g^2*n + 10*I*B*a^2*b^3

```
*c^3*d^2*g^2*n - 10*I*B*a^3*b^2*c^2*d^3*g^2*n + 5*I*B*a^4*b*c*d^4*g^2*n - I
*B*a^5*d^5*g^2*n)*log(-b + (b*x + a)*d/(d*x + c))/(b^2*d^3) + 2*(-I*B*b^5*c
^5*g^2*n + 5*I*B*a*b^4*c^4*d*g^2*n - 10*I*B*a^2*b^3*c^3*d^2*g^2*n + 10*I*B*
a^3*b^2*c^2*d^3*g^2*n - 5*I*B*a^4*b*c*d^4*g^2*n + I*B*a^5*d^5*g^2*n)*log((b
*x + a)/(d*x + c))/(b^2*d^3))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 5.02, size = 663, normalized size = 3.49

$$\ln\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\left(Ba^2cg^2ix+\frac{Bag^2ix^2(ad+2bc)}{2}+\frac{Bbg^2ix^3(2ad+bc)}{3}+\frac{Bb^2dg^2ix^4}{4}\right)+x^3\left(\frac{bg^2i(12Aad+8Abc+Badn-Bbcn)}{12}-\frac{Abg^2i(12ad+12bc)}{36}\right)+x\left(\frac{(12ad+12bc)\left(\frac{(12ad+12bc)\left(\frac{bg^2i(12Aad+8Abc+Badn-Bbcn)}{4}-\frac{Abg^2i(12ad+12bc)}{12}\right)}{12bd}-\frac{g^2i(9Aa^2d^2+3Ab^2c^2+2Ba^2d^2n-Bb^2c^2n+18Aabcd-Babcdn)}{3d}+Aabcg^2i\right)}{12bd}-\frac{ac\left(\frac{bg^2i(12Aad+8Abc+Badn-Bbcn)}{4}-\frac{Abg^2i(12ad+12bc)}{12}\right)}{bd}+\frac{ag^2i(2Aa^2d^2+6Ab^2c^2+Ba^2d^2n-2Bb^2c^2n+12Aabcd+Babcdn)}{2bd}\right)-x^2\left(\frac{(12ad+12bc)\left(\frac{bg^2i(12Aad+8Abc+Badn-Bbcn)}{4}-\frac{Abg^2i(12ad+12bc)}{12}\right)}{24bd}-\frac{g^2i(9Aa^2d^2+3Ab^2c^2+2Ba^2d^2n-Bb^2c^2n+18Aabcd-Babcdn)}{6d}+\frac{Aabcg^2i}{2}\right)-\frac{\ln(a+bx)(Ba^4dg^2in-4Ba^3bcg^2in)}{12b^2}-\frac{\ln(c+dx)(Bb^2c^4g^2in+6Ba^2c^2d^2g^2in-4Babc^3dg^2in)}{12d^3}+\frac{Ab^2dg^2ix^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)*(B*a^2*c*g^2*i*x + (B*a*g^2*i*x^2*(a*d + 2*b
*c))/2 + (B*b*g^2*i*x^3*(2*a*d + b*c))/3 + (B*b^2*d*g^2*i*x^4)/4) + x^3*((b
*g^2*i*(12*A*a*d + 8*A*b*c + B*a*d*n - B*b*c*n))/12 - (A*b*g^2*i*(12*a*d +
12*b*c))/36) + x*(((12*a*d + 12*b*c)*(((12*a*d + 12*b*c)*((b*g^2*i*(12*A*a*
d + 8*A*b*c + B*a*d*n - B*b*c*n))/4 - (A*b*g^2*i*(12*a*d + 12*b*c))/12))/(1
2*b*d) - (g^2*i*(9*A*a^2*d^2 + 3*A*b^2*c^2 + 2*B*a^2*d^2*n - B*b^2*c^2*n +
18*A*a*b*c*d - B*a*b*c*d*n))/(3*d) + A*a*b*c*g^2*i))/(12*b*d) - (a*c*((b*g^
2*i*(12*A*a*d + 8*A*b*c + B*a*d*n - B*b*c*n))/4 - (A*b*g^2*i*(12*a*d + 12*b
*c))/12))/(b*d) + (a*g^2*i*(2*A*a^2*d^2 + 6*A*b^2*c^2 + B*a^2*d^2*n - 2*B*b
^2*c^2*n + 12*A*a*b*c*d + B*a*b*c*d*n))/(2*b*d)) - x^2*(((12*a*d + 12*b*c)*
((b*g^2*i*(12*A*a*d + 8*A*b*c + B*a*d*n - B*b*c*n))/4 - (A*b*g^2*i*(12*a*d
+ 12*b*c))/12))/(24*b*d) - (g^2*i*(9*A*a^2*d^2 + 3*A*b^2*c^2 + 2*B*a^2*d^2*
n - B*b^2*c^2*n + 18*A*a*b*c*d - B*a*b*c*d*n))/(6*d) + (A*a*b*c*g^2*i)/2) -
 (log(a + b*x)*(B*a^4*d*g^2*i*n - 4*B*a^3*b*c*g^2*i*n))/(12*b^2) - (log(c +
 d*x)*(B*b^2*c^4*g^2*i*n + 6*B*a^2*c^2*d^2*g^2*i*n - 4*B*a*b*c^3*d*g^2*i*n)
)/(12*d^3) + (A*b^2*d*g^2*i*x^4)/4
```

3.110 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=149

$$-\frac{B(bc-ad)^2ginx}{6bd}+\frac{gi(a+bx)^2(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b}+\frac{(bc-ad)gi(a+bx)^2\left(A-Bn+B\log\left(\right.\right.}{6b^2}$$

```
[Out] -1/6*B*(-a*d+b*c)^2*g*i*n*x/b/d+1/3*g*i*(b*x+a)^2*(d*x+c)*(A+B*ln(e*((b*x+a
)/(d*x+c))^n))/b+1/6*(-a*d+b*c)*g*i*(b*x+a)^2*(A-B*n+B*ln(e*((b*x+a)/(d*x+c
))^n))/b^2+1/6*B*(-a*d+b*c)^3*g*i*n*ln(d*x+c)/b^2/d^2
```

Rubi [A]
time = 0.08, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 39, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {2559, 2547, 21, 45}

$$\frac{gi(a+bx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A-Bn\right)}{6b^2}+\frac{gi(a+bx)^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b}+\frac{Bgin(bc-ad)^3\log(c+dx)}{6b^2d^2}-\frac{Bginx(bc-ad)^2}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -1/6*(B*(b*c - a*d)^2*g*i*n*x)/(b*d) + (g*i*(a + b*x)^2*(c + d*x)*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/(3*b) + ((b*c - a*d)*g*i*(a + b*x)^2*(A - B*
n + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^2) + (B*(b*c - a*d)^3*g*i*n*Log
[c + d*x])/(6*b^2*d^2)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2547

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*((A +
 B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 1))), x] - Dist[B*n*((b*c - a*d)
/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ
```

```
[{a, b, c, d, e, f, g, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &
& NeQ[m, -2]
```

Rule 2559

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_)), x_Symbol] :> Simp[(f
 + g*x)^(m + 1)*(h + i*x)*((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 2
))), x] + Dist[i*((b*c - a*d)/(b*d*(m + 2))), Int[(f + g*x)^m*(A - B*n + B*
Log[e*((a + b*x)/(c + d*x))^n]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i
, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*
i, 0] && IGtQ[m, -2]
```

Rubi steps

$$\int (110c + 110dx)(ag + bgx)\left(A + B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx = \int \left(110acg\left(A + B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\right.$$

$$= (110acg)\int \left(A + B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)$$

$$= 110aAcgx + 55(bc+ad)gx^2\left(A + B\log\left(e\right.\right.$$

$$= 110aAcgx + \frac{110aBcg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.}{b}$$

$$= 110aAcgx + \frac{110aBcg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.}{b}$$

$$= 110aAcgx - \frac{55B(bc-ad)(bc+ad)gnx}{3bd} -$$

Mathematica [A]
time = 0.19, size = 189, normalized size = 1.27

$$\frac{gi\left(-a^2Bd^2(3bc+ad)n\log(a+bx) + b\left(dx(a^2Bd^2n - b^2Bcn(c+dx) + Ab^2dx(3c+2dx) + abd(6Ac+3Adx+Bdnx)) + Bd^2(6a^2c+3abx(2c+dx)+b^2x^2(3c+2dx))\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + Bc(b^2c^2-3abcd+6a^2d^2)\,n\log(c+dx)\right)\right)}{6b^2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
),x]
```

```
[Out] (g*i*(-(a^2*B*d^2*(3*b*c + a*d)*n*Log[a + b*x]) + b*(d*x*(a^2*B*d^2*n - b^2
*B*c*n*(c + d*x) + A*b^2*d*x*(3*c + 2*d*x) + a*b*d*(6*A*c + 3*A*d*x + B*d*n
*x)) + B*d^2*(6*a^2*c + 3*a*b*x*(2*c + d*x) + b^2*x^2*(3*c + 2*d*x))*Log[e*
```

```
((a + b*x)/(c + d*x))^n] + B*c*(b^2*c^2 - 3*a*b*c*d + 6*a^2*d^2)*n*Log[c +
d*x])))/(6*b^2*d^2)
```

Maple [F]
time = 0.07, size = 0, normalized size = 0.00

$$\int (bgx+ag)\,(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 388 vs. $2(141) = 282$.
time = 0.28, size = 388, normalized size = 2.60

$$\frac{1}{3}i\,Bbdgx^3\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)+\frac{1}{3}i\,Abdgx^3+\frac{1}{2}i\,Bbcgx^2\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)+\frac{1}{2}i\,Badgx^2\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)+\frac{1}{2}i\,Abcgx^2+\frac{1}{2}i\,Aadgx^2+\frac{1}{6}i\,Bbdgn\left(\frac{2a^3\log(bx+a)}{b^3}-\frac{2c^3\log(dx+c)}{d^3}-\frac{(b^2cd-abd^2)x^2-2(b^2c^2-a^2d^2)x}{b^2d^2}\right)-\frac{1}{2}i\,Bbcgn\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)-\frac{1}{2}i\,Badgn\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)+i\,Bacgn\left(\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)+i\,Bacgx\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)+i\,Aacgx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algor
ithm="maxima")
```

```
[Out] 1/3*I*B*b*d*g*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/3*I*A*b*d*g*x^
3 + 1/2*I*B*b*c*g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/2*I*B*a*d*
g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/2*I*A*b*c*g*x^2 + 1/2*I*A*
a*d*g*x^2 + 1/6*I*B*b*d*g*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 1/2*I*
B*b*c*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d
)) - 1/2*I*B*a*d*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c -
a*d)*x/(b*d)) + I*B*a*c*g*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + I*B*a*c
*g*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + I*A*a*c*g*x
```

Fricas [A]
time = 0.41, size = 281, normalized size = 1.89

$$-\frac{2(-i\,A-i\,B)b^3d^3gx^3-(3i\,Ba^2bcd^2-i\,Ba^3d^3)gn\log\left(\frac{bx+a}{b}\right)-(i\,Bb^3c^3-3i\,Bab^2c^2d)gn\log\left(\frac{dx+c}{d}\right)-((-i\,Bb^3cd^2+i\,Bab^2d^3)gn-3((-i\,A-i\,B)b^3cd^2+(-i\,A-i\,B)ab^2d^3)g)x^2+(6(-i\,A-i\,B)ab^2cd^2g-(-i\,Bb^3c^2d+i\,Ba^2bd^3)gn)x-(2i\,Bb^3d^3gnx^3+6i\,Bab^2cd^2gnx-3(-i\,Bb^3cd^2-i\,Bab^2d^3)gnx^2)\log\left(\frac{bx+a}{dx+c}\right)}{6\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algor
ithm="fricas")
```

```
[Out] -1/6*(2*(-I*A - I*B)*b^3*d^3*g*x^3 - (3*I*B*a^2*b*c*d^2 - I*B*a^3*d^3)*g*n*
log((b*x + a)/b) - (I*B*b^3*c^3 - 3*I*B*a*b^2*c^2*d)*g*n*log((d*x + c)/d) -
 ((-I*B*b^3*c*d^2 + I*B*a*b^2*d^3)*g*n - 3*((-I*A - I*B)*b^3*c*d^2 + (-I*A
```

```
- I*B)*a*b^2*d^3)*g)*x^2 + (6*(-I*A - I*B)*a*b^2*c*d^2*g - (-I*B*b^3*c^2*d
+ I*B*a^2*b*d^3)*g*n)*x - (2*I*B*b^3*d^3*g*n*x^3 + 6*I*B*a*b^2*c*d^2*g*n*x
- 3*(-I*B*b^3*c*d^2 - I*B*a*b^2*d^3)*g*n*x^2)*log((b*x + a)/(d*x + c)))/(b^
2*d^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1277 vs. $2(141) = 282$.
time = 2.69, size = 1277, normalized size = 8.57

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algor
ithm="giac")
```

```
[Out] -1/6*((I*B*b^5*c^4*g*n - 4*I*B*a*b^4*c^3*d*g*n - 3*(I*b*x + I*a)*B*b^4*c^4*
d*g*n/(d*x + c) + 6*I*B*a^2*b^3*c^2*d^2*g*n - 12*(-I*b*x - I*a)*B*a*b^3*c^3
*d^2*g*n/(d*x + c) - 4*I*B*a^3*b^2*c*d^3*g*n - 18*(I*b*x + I*a)*B*a^2*b^2*c
^2*d^3*g*n/(d*x + c) + I*B*a^4*b*d^4*g*n - 12*(-I*b*x - I*a)*B*a^3*b*c*d^4*
g*n/(d*x + c) - 3*(I*b*x + I*a)*B*a^4*d^5*g*n/(d*x + c))*log((b*x + a)/(d*x
 + c))/(b^3*d^2 - 3*(b*x + a)*b^2*d^3/(d*x + c) + 3*(b*x + a)^2*b*d^4/(d*x
+ c)^2 - (b*x + a)^3*d^5/(d*x + c)^3) + ((I*b*x + I*a)*B*b^5*c^4*d*g*n/(d*x
 + c) - 4*(I*b*x + I*a)*B*a*b^4*c^3*d^2*g*n/(d*x + c) - I*(b*x + a)^2*B*b^4
*c^4*d^2*g*n/(d*x + c)^2 - 6*(-I*b*x - I*a)*B*a^2*b^3*c^2*d^3*g*n/(d*x + c)
 + 4*I*(b*x + a)^2*B*a*b^3*c^3*d^3*g*n/(d*x + c)^2 - 4*(I*b*x + I*a)*B*a^3*
b^2*c*d^4*g*n/(d*x + c) - 6*I*(b*x + a)^2*B*a^2*b^2*c^2*d^4*g*n/(d*x + c)^2
 + (I*b*x + I*a)*B*a^4*b*d^5*g*n/(d*x + c) + 4*I*(b*x + a)^2*B*a^3*b*c*d^5*
g*n/(d*x + c)^2 - I*(b*x + a)^2*B*a^4*d^6*g*n/(d*x + c)^2 + I*A*b^6*c^4*g +
 I*B*b^6*c^4*g - 4*I*A*a*b^5*c^3*d*g - 4*I*B*a*b^5*c^3*d*g - 3*(I*b*x + I*a
)*A*b^5*c^4*d*g/(d*x + c) - 3*(I*b*x + I*a)*B*b^5*c^4*d*g/(d*x + c) + 6*I*A
*a^2*b^4*c^2*d^2*g + 6*I*B*a^2*b^4*c^2*d^2*g - 12*(-I*b*x - I*a)*A*a*b^4*c^
3*d^2*g/(d*x + c) - 12*(-I*b*x - I*a)*B*a*b^4*c^3*d^2*g/(d*x + c) - 4*I*A*a
^3*b^3*c*d^3*g - 4*I*B*a^3*b^3*c*d^3*g - 18*(I*b*x + I*a)*A*a^2*b^3*c^2*d^3
*g/(d*x + c) - 18*(I*b*x + I*a)*B*a^2*b^3*c^2*d^3*g/(d*x + c) + I*A*a^4*b^2
*d^4*g + I*B*a^4*b^2*d^4*g - 12*(-I*b*x - I*a)*A*a^3*b^2*c*d^4*g/(d*x + c)
- 12*(-I*b*x - I*a)*B*a^3*b^2*c*d^4*g/(d*x + c) - 3*(I*b*x + I*a)*A*a^4*b*d
```

```
^5*g/(d*x + c) - 3*(I*b*x + I*a)*B*a^4*b*d^5*g/(d*x + c))/(b^4*d^2 - 3*(b*x
 + a)*b^3*d^3/(d*x + c) + 3*(b*x + a)^2*b^2*d^4/(d*x + c)^2 - (b*x + a)^3*b
*d^5/(d*x + c)^3) - (-I*B*b^4*c^4*g*n + 4*I*B*a*b^3*c^3*d*g*n - 6*I*B*a^2*b
^2*c^2*d^2*g*n + 4*I*B*a^3*b*c*d^3*g*n - I*B*a^4*d^4*g*n)*log(b - (b*x + a)
*d/(d*x + c))/(b^2*d^2) - (I*B*b^4*c^4*g*n - 4*I*B*a*b^3*c^3*d*g*n + 6*I*B*
a^2*b^2*c^2*d^2*g*n - 4*I*B*a^3*b*c*d^3*g*n + I*B*a^4*d^4*g*n)*log((b*x + a
)/(d*x + c))/(b^2*d^2))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 4.84, size = 295, normalized size = 1.98

$$\ln\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\left(\frac{Bbdgix^3}{3}+\frac{Bgi(ad+bc)\,x^2}{2}+Bacgix\right)-x\left(\frac{\left(\frac{gi(6Aad+6Abc+Badn-Bbcn)}{3}-\frac{Agi(6ad+6bc)}{6}\right)(6ad+6bc)}{6bd}+Aacgi-\frac{gi(2Aa^2d^2+2Ab^2c^2+Ba^2d^2n-Bb^2c^2n+8Aabcd)}{2bd}\right)+x^2\left(\frac{gi(6Aad+6Abc+Badn-Bbcn)}{6}-\frac{Agi(6ad+6bc)}{12}\right)-\frac{\ln(a+bx)\,(Ba^3dgin-3Ba^2bcgin)}{6b^2}+\frac{\ln(c+dx)\,(Bbc^3gin-3Bac^2dgin)}{6d^2}+\frac{Abdgix^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)*((B*g*i*x^2*(a*d + b*c))/2 + (B*b*d*g*i*x^3)
/3 + B*a*c*g*i*x) - x*((((g*i*(6*A*a*d + 6*A*b*c + B*a*d*n - B*b*c*n))/3 -
(A*g*i*(6*a*d + 6*b*c))/6)*(6*a*d + 6*b*c))/(6*b*d) + A*a*c*g*i - (g*i*(2*A
*a^2*d^2 + 2*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 8*A*a*b*c*d))/(2*b*d))
 + x^2*((g*i*(6*A*a*d + 6*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*g*i*(6*a*d + 6
*b*c))/12) - (log(a + b*x)*(B*a^3*d*g*i*n - 3*B*a^2*b*c*g*i*n))/(6*b^2) + (
log(c + d*x)*(B*b*c^3*g*i*n - 3*B*a*c^2*d*g*i*n))/(6*d^2) + (A*b*d*g*i*x^3)
/3
```

3.111 $\int (ci + dix) \left(A + B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=86

$$-\frac{B(bc-ad)inx}{2b} - \frac{B(bc-ad)^2 in\log(a+bx)}{2b^2d} + \frac{i(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d}$$

```
[Out] -1/2*B*(-a*d+b*c)*i*n*x/b-1/2*B*(-a*d+b*c)^2*i*n*ln(b*x+a)/b^2/d+1/2*i*(d*x
+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d
```

Rubi [A]
time = 0.04, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {2547, 21, 45}

$$\frac{i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d} - \frac{Bin(bc-ad)^2\log(a+bx)}{2b^2d} - \frac{Binx(bc-ad)}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -1/2*(B*(b*c - a*d)*i*n*x)/b - (B*(b*c - a*d)^2*i*n*Log[a + b*x])/(2*b^2*d)
 + (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2547

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*((A +
 B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 1))), x] - Dist[B*n*((b*c - a*d)
/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ
[{a, b, c, d, e, f, g, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &
& NeQ[m, -2]
```

Rubi steps

$$\begin{aligned}\int (111c+111dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx &= \frac{111(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d}-\frac{(Bn)\int \frac{12321}{}}{2}\\ &= \frac{111(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d}-\frac{(111B(bc-}{}\\ &= \frac{111(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d}-\frac{(111B(bc-}{}\\ &= -\frac{111B(bc-ad)nx}{2b}-\frac{111B(bc-ad)^2n\log(a+bx)}{2b^2d}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 74, normalized size = 0.86

$$\frac{i\left(-\frac{B(bc-ad)n(bdx+(bc-ad)\log(a+bx))}{b^2}+(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
[Out] (i*(-((B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a + b*x]))/b^2) + (c + d*x)
^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(2*d)
```

Maple [F]
time = 0.09, size = 0, normalized size = 0.00

$$\int (dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A]
time = 0.27, size = 155, normalized size = 1.80

$$\frac{1}{2}i\,Bdx^2\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)+\frac{1}{2}i\,Adx^2-\frac{1}{2}i\,Bdn\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)+i\,Bcn\left(\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)+i\,Bcx\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)+i\,Acx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima
")
```

```
[Out] 1/2*I*B*d*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/2*I*A*d*x^2 - 1/2*
I*B*d*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))
 + I*B*c*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + I*B*c*x*log((b*x/(d*x +
c) + a/(d*x + c))^n*e) + I*A*c*x
```

Fricas [A]
time = 0.38, size = 152, normalized size = 1.77

$$\frac{(i\,A + i\,B)b^2d^2x^2 - i\,Bb^2c^2n\log\left(\frac{dx+c}{d}\right) + (2i\,Babcd - i\,Ba^2d^2)n\log\left(\frac{bx+a}{b}\right) - (2\,(-i\,A - i\,B)b^2cd - (-i\,Bb^2cd + i\,Babd^2)n)x + (i\,Bb^2d^2nx^2 + 2i\,Bb^2cdnx)\log\left(\frac{bx+a}{dx+c}\right)}{2\,b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas
")
```

```
[Out] 1/2*((I*A + I*B)*b^2*d^2*x^2 - I*B*b^2*c^2*n*log((d*x + c)/d) + (2*I*B*a*b*
c*d - I*B*a^2*d^2)*n*log((b*x + a)/b) - (2*(-I*A - I*B)*b^2*c*d - (-I*B*b^2
*c*d + I*B*a*b*d^2)*n)*x + (I*B*b^2*d^2*n*x^2 + 2*I*B*b^2*c*d*n*x)*log((b*x
 + a)/(d*x + c)))/(b^2*d)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 382 vs. 2(73) = 146.
time = 159.15, size = 382, normalized size = 4.44

$$\begin{cases} cix\left(A + B\log\left(e\left(\frac{a}{c}\right)^n\right)\right) & \text{for}\: b = 0 \wedge d = 0 \\ ci\left(Ax + \frac{Ba\log\left(e\left(\frac{a}{c} + \frac{bx}{c}\right)^n\right)}{b} - Bnx + Bx\log\left(e\left(\frac{a}{c} + \frac{bx}{c}\right)^n\right)\right) & \text{for}\: d = 0 \\ Acix + \frac{Adix^2}{2} + \frac{Bc^2i\log\left(e\left(\frac{a}{c+dx}\right)^n\right)}{2d} + \frac{Bcinx}{2} + Bcix\log\left(e\left(\frac{a}{c+dx}\right)^n\right) + \frac{Bdinx^2}{4} + \frac{Bdix^2\log\left(e\left(\frac{a}{c+dx}\right)^n\right)}{2} & \text{for}\: b = 0 \\ Acix + \frac{Adix^2}{2} - \frac{Ba^2din\log\left(\frac{c}{d}+x\right)}{2b^2} - \frac{Ba^2di\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{2b^2} + \frac{Bacin\log\left(\frac{c}{d}+x\right)}{b} + \frac{Baci\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{b} + \frac{Badinx}{2b} - \frac{Bc^2in\log\left(\frac{c}{d}+x\right)}{2d} - \frac{Bcinx}{2} + Bcix\log\left(e\left(\frac{a}{c+dx} + \frac{bx}{c+dx}\right)^n\right) + \frac{Bdix^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Piecewise((c*i*x*(A + B*log(e*(a/c)**n)), Eq(b, 0) & Eq(d, 0)), (c*i*(A*x +
 B*a*log(e*(a/c + b*x/c)**n)/b - B*n*x + B*x*log(e*(a/c + b*x/c)**n)), Eq(d
, 0)), (A*c*i*x + A*d*i*x**2/2 + B*c**2*i*log(e*(a/(c + d*x))**n)/(2*d) + B
*c*i*n*x/2 + B*c*i*x*log(e*(a/(c + d*x))**n) + B*d*i*n*x**2/4 + B*d*i*x**2*
log(e*(a/(c + d*x))**n)/2, Eq(b, 0)), (A*c*i*x + A*d*i*x**2/2 - B*a**2*d*i*
n*log(c/d + x)/(2*b**2) - B*a**2*d*i*log(e*(a/(c + d*x) + b*x/(c + d*x))**n
)/(2*b**2) + B*a*c*i*n*log(c/d + x)/b + B*a*c*i*log(e*(a/(c + d*x) + b*x/(c
 + d*x))**n)/b + B*a*d*i*n*x/(2*b) - B*c**2*i*n*log(c/d + x)/(2*d) - B*c*i*
n*x/2 + B*c*i*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n) + B*d*i*x**2*log(e*
(a/(c + d*x) + b*x/(c + d*x))**n)/2, True))
```

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 561 vs. 2(78) = 156.
time = 2.52, size = 561, normalized size = 6.52

$$-\frac{1}{2}\left(\frac{\left(-i\,Bb^3c^3n + 3i\,Bab^2c^2dn - 3i\,Ba^2bcd^2n + i\,Ba^3d^3n\right)\log\left(\frac{bx+a}{dx+c}\right)}{b^2d - \frac{2\,(bx+a)bd^2}{dx+c} + \frac{(bx+a)^2d^3}{(dx+c)^2}} + \frac{i\,Bb^4c^3n - 3i\,Bab^3c^2dn + \frac{(-i\,bx-i\,a)Bb^3c^3dn}{dx+c} + 3i\,Ba^2b^2cd^2n - \frac{3\,(-i\,bx-i\,a)Bab^2c^2d^2n}{dx+c} - i\,Ba^3bd^3n - \frac{3\,(i\,bx+i\,a)Ba^2bcd^3n}{dx+c} + \frac{(i\,bx+i\,a)Ba^3d^4n}{dx+c} - i\,Ab^4c^3 - i\,Bb^4c^3 + 3i\,Aab^3c^2d + 3i\,Bab^3c^2d - 3i\,Aa^2b^2cd^2 - 3i\,Ba^2b^2cd^2 + i\,Aa^3bd^3 + i\,Ba^3bd^3}{b^3d - \frac{2\,(bx+a)b^2d^2}{dx+c} + \frac{(bx+a)^2bd^3}{(dx+c)^2}} - \frac{\left(i\,Bb^3c^3n - 3i\,Bab^2c^2dn + 3i\,Ba^2bcd^2n - i\,Ba^3d^3n\right)\log\left(-b + \frac{(bx+a)d}{dx+c}\right)}{b^2d} - \frac{\left(-i\,Bb^3c^3n + 3i\,Bab^2c^2dn - 3i\,Ba^2bcd^2n + i\,Ba^3d^3n\right)\log\left(\frac{bx+a}{dx+c}\right)}{b^2d}\right)\left(\frac{bc}{(bc-ad)^2} - \frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] -1/2*((-I*B*b^3*c^3*n + 3*I*B*a*b^2*c^2*d*n - 3*I*B*a^2*b*c*d^2*n + I*B*a^3
*d^3*n)*log((b*x + a)/(d*x + c))/(b^2*d - 2*(b*x + a)*b*d^2/(d*x + c) + (b*
x + a)^2*d^3/(d*x + c)^2) + (I*B*b^4*c^3*n - 3*I*B*a*b^3*c^2*d*n + (-I*b*x
- I*a)*B*b^3*c^3*d*n/(d*x + c) + 3*I*B*a^2*b^2*c*d^2*n - 3*(-I*b*x - I*a)*B
*a*b^2*c^2*d^2*n/(d*x + c) - I*B*a^3*b*d^3*n - 3*(I*b*x + I*a)*B*a^2*b*c*d^
3*n/(d*x + c) + (I*b*x + I*a)*B*a^3*d^4*n/(d*x + c) - I*A*b^4*c^3 - I*B*b^4
*c^3 + 3*I*A*a*b^3*c^2*d + 3*I*B*a*b^3*c^2*d - 3*I*A*a^2*b^2*c*d^2 - 3*I*B*
a^2*b^2*c*d^2 + I*A*a^3*b*d^3 + I*B*a^3*b*d^3)/(b^3*d - 2*(b*x + a)*b^2*d^2
/(d*x + c) + (b*x + a)^2*b*d^3/(d*x + c)^2) - (I*B*b^3*c^3*n - 3*I*B*a*b^2*
c^2*d*n + 3*I*B*a^2*b*c*d^2*n - I*B*a^3*d^3*n)*log(-b + (b*x + a)*d/(d*x +
c))/(b^2*d) - (-I*B*b^3*c^3*n + 3*I*B*a*b^2*c^2*d*n - 3*I*B*a^2*b*c*d^2*n +
 I*B*a^3*d^3*n)*log((b*x + a)/(d*x + c))/(b^2*d))*(b*c/(b*c - a*d)^2 - a*d/
(b*c - a*d)^2)
```

Mupad [B]
time = 4.34, size = 134, normalized size = 1.56

$$x\left(\frac{i\,(2\,A\,a\,d+4\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n)}{2\,b}-\frac{A\,i\,(2\,a\,d+2\,b\,c)}{2\,b}\right)+\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\left(\frac{B\,d\,i\,x^2}{2}+B\,c\,i\,x\right)-\frac{\ln(a+b\,x)\,\left(B\,a^2\,d\,i\,n-2\,B\,a\,b\,c\,i\,n\right)}{2\,b^2}+\frac{A\,d\,i\,x^2}{2}-\frac{B\,c^2\,i\,n\,\ln(c+d\,x)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] x*((i*(2*A*a*d + 4*A*b*c + B*a*d*n - B*b*c*n))/(2*b) - (A*i*(2*a*d + 2*b*c)
)/(2*b)) + log(e*((a + b*x)/(c + d*x))^n)*((B*d*i*x^2)/2 + B*c*i*x) - (log(
a + b*x)*(B*a^2*d*i*n - 2*B*a*b*c*i*n))/(2*b^2) + (A*d*i*x^2)/2 - (B*c^2*i*
n*log(c + d*x))/(2*d)
```

3.112 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=141

$$\frac{i(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg}-\frac{(bc-ad)i\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(A-Bn+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g}+\frac{B(bc-ad)in\mathrm{Li}}{b^2}$$

```
[Out] i*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/g-(-a*d+b*c)*i*ln((a*d-b*c)/d/(
b*x+a))*(A-B*n+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/g+B*(-a*d+b*c)*i*n*polylog(
2,1+(-a*d+b*c)/d/(b*x+a))/b^2/g
```

Rubi [A]
time = 0.20, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.146, Rules used = {2559, 2541, 2458, 2378, 2370, 2352}

$$\frac{Bin(bc-ad)\mathrm{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b^2g}-\frac{i(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A-Bn\right)}{b^2g}+\frac{i(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bg}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x),x]
```

```
[Out] (i*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b*g) - ((b*c - a*d)*i
*Log[-((b*c - a*d)/(d*(a + b*x)))]*(A - B*n + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(b^2*g) + (B*(b*c - a*d)*i*n*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))
])/(b^2*g)
```

Rule 2352

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[(-e^(-1))*PolyLo
g[2, 1 - c*x], x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2370

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2378

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2458

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[(g*(x/e))^q*((e*h - d*i)/e + i*(x/e))^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2541

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))/((f_.) + (g_.)*(x_)), x_Symbol] :> Simp[(-Log[-(b*c - a*d)/(d*(a + b*
x))])*((A + B*Log[e*((a + b*x)/(c + d*x))^n])/g), x] + Dist[B*n*((b*c - a*d
)/g), Int[Log[-(b*c - a*d)/(d*(a + b*x))]/((a + b*x)*(c + d*x)), x], x] /;
FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[b*f -
a*g, 0]
```

Rule 2559

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_)), x_Symbol] :> Simp[(f
 + g*x)^(m + 1)*(h + i*x)*((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 2
))), x] + Dist[i*((b*c - a*d)/(b*d*(m + 2))), Int[(f + g*x)^m*(A - B*n + B*
Log[e*((a + b*x)/(c + d*x))^n]), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i
, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*
i, 0] && IGtQ[m, -2]
```

Rubi steps

$$\int \frac{(112c+112dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx = \int \left(\frac{112d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg}+\frac{112(bc-ad)\left(A+B\log\right.}{bg(a+bx)}\right.$$

$$= \frac{(112d)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{bg}+\frac{(112(bc-ad))\int\frac{A+}{}}{bg}$$

$$= \frac{112Adx}{bg}+\frac{112(bc-ad)\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g}$$

$$= \frac{112Adx}{bg}+\frac{112Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g}+\frac{112(bc-ad)\,\mathrm{lo}}{}$$

$$= \frac{112Adx}{bg}+\frac{112Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g}+\frac{112(bc-ad)\,\mathrm{lo}}{}$$

$$= \frac{112Adx}{bg}+\frac{112Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g}+\frac{112(bc-ad)\,\mathrm{lo}}{}$$

$$= \frac{112Adx}{bg}-\frac{56B(bc-ad)n\log^2(a+bx)}{b^2g}+\frac{112Bd(a+bx)\,\mathrm{lo}}{b^2g}$$

$$= \frac{112Adx}{bg}-\frac{56B(bc-ad)n\log^2(a+bx)}{b^2g}+\frac{112Bd(a+bx)\,\mathrm{lo}}{b^2g}$$

Mathematica [A]

time = 0.09, size = 172, normalized size = 1.22

$$\frac{i\left(B(-bc+ad)n\log^2(a+bx)+2\left(Abdx+Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+B(-bc+ad)n\log(c+dx)\right)+2(bc-ad)\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2B(bc-ad)n\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)}{2b^2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x),x]
```

```
[Out] (i*(B*(-(b*c) + a*d)*n*Log[a + b*x]^2 + 2*(A*b*d*x + B*d*(a + b*x)*Log[e*((
a + b*x)/(c + d*x))^n] + B*(-(b*c) + a*d)*n*Log[c + d*x]) + 2*(b*c - a*d)*L
og[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(b*(c + d*x))/(
b*c - a*d)]) + 2*B*(b*c - a*d)*n*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))
/(2*b^2*g)
```

Maple [F]

time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

Maxima [A]
time = 0.53, size = 262, normalized size = 1.86

$$i\,Ad\left(\frac{x}{bg}-\frac{a\log\left(bx+a\right)}{b^2g}\right)-\frac{i\,Bcn\log\left(dx+c\right)}{bg}+\frac{i\,Ac\log\left(bgx+ag\right)}{bg}-\frac{\left(-i\,bcn+i\,adn\right)\left(\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{b^2g}+\frac{2i\,Bbdx+\left(-i\,bcn+i\,adn\right)B\log\left(bx+a\right)^2-2\left(ad(-i\,n+i)-i\,bc\right)B\log\left(bx+a\right)-2\left(-i\,Bbdx+\left(-i\,bc+i\,ad\right)B\log\left(bx+a\right)\right)\log\left(\left(bx+a\right)^n\right)-2\left(i\,Bbdx+\left(i\,bc-i\,ad\right)B\log\left(bx+a\right)\right)\log\left(\left(dx+c\right)^n\right)}{2\,b^2g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algor
ithm="maxima")
```

```
[Out] I*A*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - I*B*c*n*log(d*x + c)/(b*g) + I*A
*c*log(b*g*x + a*g)/(b*g) - (-I*b*c*n + I*a*d*n)*(log(b*x + a)*log((b*d*x +
 a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^2*g) + 1/2
*(2*I*B*b*d*x + (-I*b*c*n + I*a*d*n)*B*log(b*x + a)^2 - 2*(a*d*(-I*n + I) -
 I*b*c)*B*log(b*x + a) - 2*(-I*B*b*d*x + (-I*b*c + I*a*d)*B*log(b*x + a))*l
og((b*x + a)^n) - 2*(I*B*b*d*x + (I*b*c - I*a*d)*B*log(b*x + a))*log((d*x +
 c)^n))/(b^2*g)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algor
ithm="fricas")
```

```
[Out] integral(((I*A + I*B)*d*x + (I*A + I*B)*c + (I*B*d*n*x + I*B*c*n)*log((b*x
+ a)/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\left(\int\frac{Ac}{a+bx}\,dx+\int\frac{Adx}{a+bx}\,dx+\int\frac{Bc\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{a+bx}\,dx+\int\frac{Bdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g),x)
```

```
[Out] i*(Integral(A*c/(a + b*x), x) + Integral(A*d*x/(a + b*x), x) + Integral(B*c
*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x) + Integral(B*d*x*log
(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x))/g
```

<u>**Giac**</u> [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algor
ithm="giac")
```

```
[Out] integrate((I*d*x + I*c)*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(b*g*x + a*g
), x)
```

<u>**Mupad**</u> [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(c\,i+d\,i\,x)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x),x)
```

```
[Out] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x), x
)
```

3.113 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=150

$$-\frac{Bin(c+dx)}{bg^2(a+bx)}-\frac{i(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^2(a+bx)}-\frac{di\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2}+\frac{Bdin\text{Li}_2(}{b^2g}$$

```
[Out] -B*i*n*(d*x+c)/b/g^2/(b*x+a)-i*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/g^
2/(b*x+a)-d*i*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x+a))/b^2
/g^2+B*d*i*n*polylog(2,b*(d*x+c)/d/(b*x+a))/b^2/g^2
```

Rubi [A]
time = 0.14, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.122$, Rules used = {2561, 2380, 2341, 2379, 2438}

$$\frac{Bdin\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2}-\frac{di\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^2}-\frac{i(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bg^2(a+bx)}-\frac{Bin(c+dx)}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^2,
x]
```

```
[Out] -((B*i*n*(c + d*x))/(b*g^2*(a + b*x))) - (i*(c + d*x)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/(b*g^2*(a + b*x)) - (d*i*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (B*d*i*n*PolyLog[
2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
```

```
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(113c+113dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx = \int \left(\frac{113(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^2(a+bx)^2}+\frac{113d(A+B\log}{bg^2(a+}\right.$$

$$=\frac{(113d)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{bg^2}+\frac{(113(bc-ad))\int\frac{A+B\log\left(e\left(\frac{a}{c}\right.\right.}{(a+bx)}}{bg^2}$$

$$=-\frac{113(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2(a+bx)}+\frac{113d\log(a+bx)\,(}{}$$

$$=-\frac{113(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2(a+bx)}+\frac{113d\log(a+bx)\,(}{}$$

$$=-\frac{113(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2(a+bx)}+\frac{113d\log(a+bx)\,(}{}$$

$$=-\frac{113B(bc-ad)n}{b^2g^2(a+bx)}-\frac{113Bdn\log(a+bx)}{b^2g^2}-\frac{113(bc-ad)\,(}{b^2g}$$

$$=-\frac{113B(bc-ad)n}{b^2g^2(a+bx)}-\frac{113Bdn\log(a+bx)}{b^2g^2}-\frac{113Bdn\log^2(a}{2b^2g^2}$$

$$=-\frac{113B(bc-ad)n}{b^2g^2(a+bx)}-\frac{113Bdn\log(a+bx)}{b^2g^2}-\frac{113Bdn\log^2(a}{2b^2g^2}$$

Mathematica [A]
time = 0.12, size = 189, normalized size = 1.26

$$\frac{i\left(-\frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2(a+bx)}+\frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2}-\frac{Bn\left(\frac{bc-ad}{a+bx}+d\log(a+bx)-d\log(c+dx)\right)}{b^2}-\frac{Bdn\left(\log^2(a+bx)-2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)-2\text{Li}_2\left(-\frac{d(a+bx)}{bc-ad}\right)\right)}{2b^2}\right)}{g^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x)^2,x]
```

```
[Out] (i*(-(((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*(a + b*x)))
 + (d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/b^2 - (B*n*((b*c
 - a*d)/(a + b*x) + d*Log[a + b*x] - d*Log[c + d*x]))/b^2 - (B*d*n*(Log[a +
 b*x]^2 - 2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))]))/(2*b^2)))/g^2
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, alg
orithm="maxima")
```

```
[Out] -I*B*c*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) -
d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + I*B*d*((((b*x + a)*log(b*x + a) + a
)*log((b*x + a)^n) - ((b*x + a)*log(b*x + a) + a)*log((d*x + c)^n))/(b^3*g^
2*x + a*b^2*g^2) + integrate((b^2*d*x^2 - a*b*c*n + a^2*d*n + b^2*c*x - (a*
b*c*n - a^2*d*n + (b^2*c*n - a*b*d*n)*x)*log(b*x + a))/(b^4*d*g^2*x^3 + a^2
*b^2*c*g^2 + (b^4*c*g^2 + 2*a*b^3*d*g^2)*x^2 + (2*a*b^3*c*g^2 + a^2*b^2*d*g
^2)*x), x)) + I*A*d*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) -
I*B*c*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^2*g^2*x + a*b*g^2) - I*A*c/
(b^2*g^2*x + a*b*g^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, alg
orithm="fricas")
```

```
[Out] integral(((I*A + I*B)*d*x + (I*A + I*B)*c + (I*B*d*n*x + I*B*c*n)*log((b*x
+ a)/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, alg
orithm="giac")
```

```
[Out] integrate((I*d*x + I*c)*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(b*g*x + a*g
)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(c\,i+d\,i\,x)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{(a\,g+b\,g\,x)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^2,
x)
```

```
[Out] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^2,
 x)
```

3.114 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=89

$$-\frac{Bin(c+dx)^2}{4(bc-ad)g^3(a+bx)^2}-\frac{i(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2(bc-ad)g^3(a+bx)^2}$$

```
[Out] -1/4*B*i*n*(d*x+c)^2/(-a*d+b*c)/g^3/(b*x+a)^2-1/2*i*(d*x+c)^2*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))/(-a*d+b*c)/g^3/(b*x+a)^2
```

Rubi [A]
time = 0.05, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.049$, Rules used = {2561, 2341}

$$-\frac{i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3(a+bx)^2(bc-ad)}-\frac{Bin(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^3,
x]
```

```
[Out] -1/4*(B*i*n*(c + d*x)^2)/((b*c - a*d)*g^3*(a + b*x)^2) - (i*(c + d*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*g^3*(a + b*x)^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(114c+114dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx = \int \left(\frac{114(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^3(a+bx)^3} + \frac{114d(A+B\log}{bg^3(a-}\right.$$

$$= \frac{(114d)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}dx}{bg^3} + \frac{(114(bc-ad))\int \frac{A+B\log\left(e\left(\frac{a}{c}\right.\right.}{(a+bx)}}{bg^3}$$

$$= -\frac{57(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)^2} - \frac{114d(A+B\log(e}{b^2g^3(a+b}$$

$$= -\frac{57(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)^2} - \frac{114d(A+B\log(e}{b^2g^3(a+b}$$

$$= -\frac{57(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)^2} - \frac{114d(A+B\log(e}{b^2g^3(a+b}$$

$$= -\frac{57B(bc-ad)n}{2b^2g^3(a+bx)^2} - \frac{57Bdn}{b^2g^3(a+bx)} - \frac{57Bd^2n\log(a+bx)}{b^2(bc-ad)g^3} - $$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 216 vs. 2(89) = 178.
time = 0.11, size = 216, normalized size = 2.43

$$\frac{i\left(-\frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2(a+bx)^2} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2(a+bx)} - \frac{Bdn\left(\frac{1}{a+bx}+\frac{d\log(a+bx)}{bc-ad}-\frac{d\log(c+dx)}{bc-ad}\right)}{b^2} - \frac{Bn\left(\frac{bc-ad}{(a+bx)^2}-\frac{2d}{a+bx}-\frac{2d^2\log(a+bx)}{bc-ad}+\frac{2d^2\log(c+dx)}{bc-ad}\right)}{4b^2}\right)}{g^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x)^3,x]
```

```
[Out] (i*(-1/2*((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*(a + b*x
)^2) - (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*(a + b*x)) - (B*d*n*
((a + b*x)^(-1) + (d*Log[a + b*x])/(b*c - a*d) - (d*Log[c + d*x])/(b*c - a*
d)))/b^2 - (B*n*((b*c - a*d)/(a + b*x)^2 - (2*d)/(a + b*x) - (2*d^2*Log[a +
 b*x])/(b*c - a*d) + (2*d^2*Log[c + d*x])/(b*c - a*d)))/(4*b^2)))/g^3
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 578 vs. $2(84) = 168$.
time = 0.29, size = 578, normalized size = 6.49

$$-\frac{1}{4}i\,Bdn\left(\frac{3\,abc-a^2d+2\,(2\,b^2c-abd)x}{(b^5c-ab^4d)g^3x^2+2\,(ab^4c-a^2b^3d)g^3x+(a^2b^3c-a^3b^2d)g^3}+\frac{2\,(2\,bcd-ad^2)\log\left(bx+a\right)}{(b^4c^2-2\,ab^3cd+a^2b^2d^2)g^3}-\frac{2\,(2\,bcd-ad^2)\log\left(dx+c\right)}{(b^4c^2-2\,ab^3cd+a^2b^2d^2)g^3}\right)+\frac{1}{4}i\,Bcn\left(\frac{2\,bdx-bc+3\,ad}{(b^4c-ab^3d)g^3x^2+2\,(ab^3c-a^2b^2d)g^3x+(a^2b^2c-a^3bd)g^3}+\frac{2\,d^2\log\left(bx+a\right)}{(b^3c^2-2\,ab^2cd+a^2bd^2)g^3}-\frac{2\,d^2\log\left(dx+c\right)}{(b^3c^2-2\,ab^2cd+a^2bd^2)g^3}\right)-\frac{i\,(2\,bx+a)Bd\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)}{2\,(b^4g^3x^2+2\,ab^3g^3x+a^2b^2g^3)}-\frac{i\,(2\,bx+a)Ad}{2\,(b^4g^3x^2+2\,ab^3g^3x+a^2b^2g^3)}-\frac{i\,Bc\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)}{2\,(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3)}-\frac{i\,Ac}{2\,(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, alg
orithm="maxima")
```

```
[Out] -1/4*I*B*d*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*
g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*
(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3)
- 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g
^3)) + 1/4*I*B*c*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*
(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x +
a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2
 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*I*(2*b*x + a)*B*d*log((b*x/(d*x + c
) + a/(d*x + c))^n*e)/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*I*(
2*b*x + a)*A*d/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*I*B*c*log(
(b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3
) - 1/2*I*A*c/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 223 vs. $2(84) = 168$.
time = 0.43, size = 223, normalized size = 2.51

$$\frac{2\,(-i\,A-i\,B)b^2c^2+2\,(i\,A+i\,B)a^2d^2-(i\,Bb^2c^2-i\,Ba^2d^2)n+2\,(2\,(-i\,A-i\,B)b^2cd+2\,(i\,A+i\,B)abd^2+(-i\,Bb^2cd+i\,Babd^2)n)x+2\,(-i\,Bb^2d^2nx^2-2i\,Bb^2cdnx-i\,Bb^2c^2n)\log\left(\frac{bx+a}{dx+c}\right)}{4\,((b^5c-ab^4d)g^3x^2+2\,(ab^4c-a^2b^3d)g^3x+(a^2b^3c-a^3b^2d)g^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, alg
orithm="fricas")
```

```
[Out] 1/4*(2*(-I*A - I*B)*b^2*c^2 + 2*(I*A + I*B)*a^2*d^2 - (I*B*b^2*c^2 - I*B*a^
2*d^2)*n + 2*(2*(-I*A - I*B)*b^2*c*d + 2*(I*A + I*B)*a*b*d^2 + (-I*B*b^2*c*
d + I*B*a*b*d^2)*n)*x + 2*(-I*B*b^2*d^2*n*x^2 - 2*I*B*b^2*c*d*n*x - I*B*b^2
*c^2*n)*log((b*x + a)/(d*x + c)))/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c -
 a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.35, size = 95, normalized size = 1.07

$$-\frac{1}{4}\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)\left(\frac{2i\,(dx+c)^2 Bn\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)^2g^3}+\frac{(i\,Bn+2i\,A+2i\,B)(dx+c)^2}{(bx+a)^2g^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, alg
orithm="giac")
```

```
[Out] -1/4*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)*(2*I*(d*x + c)^2*B*n*log((b*x
+ a)/(d*x + c))/((b*x + a)^2*g^3) + (I*B*n + 2*I*A + 2*I*B)*(d*x + c)^2/((b
*x + a)^2*g^3))
```

Mupad [B]
time = 5.25, size = 204, normalized size = 2.29

$$-\frac{x\,(2\,A\,b\,d\,i+B\,b\,d\,i\,n)+A\,a\,d\,i+A\,b\,c\,i+\frac{B\,a\,d\,i\,n}{2}+\frac{B\,b\,c\,i\,n}{2}}{2\,a^2\,b^2\,g^3+4\,a\,b^3\,g^3\,x+2\,b^4\,g^3\,x^2}-\frac{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,\left(\frac{B\,c\,i}{2\,b}+\frac{B\,a\,d\,i}{2\,b^2}+\frac{B\,d\,i\,x}{b}\right)}{a^2\,g^3+2\,a\,b\,g^3\,x+b^2\,g^3\,x^2}-\frac{B\,d^2\,i\,n\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,1\mathrm{i}}{b^2\,g^3\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^3,
x)
```

```
[Out] - (x*(2*A*b*d*i + B*b*d*i*n) + A*a*d*i + A*b*c*i + (B*a*d*i*n)/2 + (B*b*c*i
*n)/2)/(2*a^2*b^2*g^3 + 2*b^4*g^3*x^2 + 4*a*b^3*g^3*x) - (log(e*((a + b*x)/
(c + d*x))^n)*((B*c*i)/(2*b) + (B*a*d*i)/(2*b^2) + (B*d*i*x)/b))/(a^2*g^3 +
 b^2*g^3*x^2 + 2*a*b*g^3*x) - (B*d^2*i*n*atan((b*c*2i + b*d*x*2i)/(a*d - b*
c) + 1i)*1i)/(b^2*g^3*(a*d - b*c))
```

3.115 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=181

$$\frac{Bdin(c+dx)^2}{4(bc-ad)^2g^4(a+bx)^2}-\frac{bBin(c+dx)^3}{9(bc-ad)^2g^4(a+bx)^3}+\frac{di(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2(bc-ad)^2g^4(a+bx)^2}-\frac{bi(c+dx)^3\left(A+B\right.}{3(bc-ad)^2g}$$

```
[Out] 1/4*B*d*i*n*(d*x+c)^2/(-a*d+b*c)^2/g^4/(b*x+a)^2-1/9*b*B*i*n*(d*x+c)^3/(-a*
d+b*c)^2/g^4/(b*x+a)^3+1/2*d*i*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-
a*d+b*c)^2/g^4/(b*x+a)^2-1/3*b*i*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/
(-a*d+b*c)^2/g^4/(b*x+a)^3
```

Rubi [A]
time = 0.09, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$, Rules used = {2561, 45, 2372, 12}

$$-\frac{bi(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4(a+bx)^3(bc-ad)^2}+\frac{di(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^4(a+bx)^2(bc-ad)^2}-\frac{bBin(c+dx)^3}{9g^4(a+bx)^3(bc-ad)^2}+\frac{Bdin(c+dx)^2}{4g^4(a+bx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^4,
x]
```

```
[Out] (B*d*i*n*(c + d*x)^2)/(4*(b*c - a*d)^2*g^4*(a + b*x)^2) - (b*B*i*n*(c + d*x
)^3)/(9*(b*c - a*d)^2*g^4*(a + b*x)^3) + (d*i*(c + d*x)^2*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^2*g^4*(a + b*x)^2) - (b*i*(c + d*x)^3
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^2*g^4*(a + b*x)^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
```

```
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(115c+115dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx = \int \left(\frac{115(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^4(a+bx)^4} + \frac{115d(A+B\log}{bg^4(a-}\right.$$

$$= \frac{(115d)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^3}\,dx}{bg^4} + \frac{(115(bc-ad))\int \frac{A+B\log\left(e\left(\frac{a}{c}\right.\right.}{(a+bx)}}{bg^4}$$

$$= -\frac{115(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2g^4(a+bx)^3} - \frac{115d\left(A+B\log\left(\right.\right.}{2b^2g^4(a+}$$

$$= -\frac{115(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2g^4(a+bx)^3} - \frac{115d\left(A+B\log\left(\right.\right.}{2b^2g^4(a+}$$

$$= -\frac{115(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2g^4(a+bx)^3} - \frac{115d\left(A+B\log\left(\right.\right.}{2b^2g^4(a+}$$

$$= -\frac{115B(bc-ad)n}{9b^2g^4(a+bx)^3} - \frac{115Bdn}{12b^2g^4(a+bx)^2} + \frac{115Bd^2n}{6b^2(bc-ad)g^4(a+}$$

Mathematica [A]
time = 0.30, size = 196, normalized size = 1.08

$$-\frac{i\left(\frac{12Abc}{(a+bx)^3}-\frac{12aAd}{(a+bx)^3}+\frac{4bBcn}{(a+bx)^3}-\frac{4aBdn}{(a+bx)^3}+\frac{18Ad}{(a+bx)^2}+\frac{3Bdn}{(a+bx)^2}-\frac{6Bd^2n}{(bc-ad)(a+bx)}-\frac{6Bd^3n\log(a+bx)}{(bc-ad)^2}+\frac{6B(2bc+ad+3bdx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^3}+\frac{6Bd^3n\log(c+dx)}{(bc-ad)^2}\right)}{36b^2g^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x)^4,x]
```

```
[Out] -1/36*(i*((12*A*b*c)/(a + b*x)^3 - (12*a*A*d)/(a + b*x)^3 + (4*b*B*c*n)/(a
+ b*x)^3 - (4*a*B*d*n)/(a + b*x)^3 + (18*A*d)/(a + b*x)^2 + (3*B*d*n)/(a +
```

```
b*x)^2 - (6*B*d^2*n)/((b*c - a*d)*(a + b*x)) - (6*B*d^3*n*Log[a + b*x])/(b*
c - a*d)^2 + (6*B*(2*b*c + a*d + 3*b*d*x)*Log[e*((a + b*x)/(c + d*x))^n])/(
a + b*x)^3 + (6*B*d^3*n*Log[c + d*x])/(b*c - a*d)^2))/(b^2*g^4)
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{(dix + ci)\left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)}{(bgx + ag)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 941 vs. 2(171) = 342.
time = 0.32, size = 941, normalized size = 5.20

$$-\frac{1}{18}\, iBcn\left(\frac{6\, b^{2}d^{2}x^{2} + 2\, b^{2}c^{2} - 7\, abcd + 11\, a^{2}d^{2} - 3\,(b^{2}cd - 5\, abd^{2})x}{(b^{6}c^{2} - 2\, ab^{5}cd + a^{2}b^{4}d^{2})g^{4}x^{3} + 3\,(ab^{5}c^{2} - 2\, a^{2}b^{4}cd + a^{3}b^{3}d^{2})g^{4}x^{2} + 3\,(a^{2}b^{4}c^{2} - 2\, a^{3}b^{3}cd + a^{4}b^{2}d^{2})g^{4}x + (a^{3}b^{3}c^{2} - 2\, a^{4}b^{2}cd + a^{5}bd^{2})g^{4}} + \frac{6\, d^{3}\log(bx+a)}{(b^{4}c^{3} - 3\, ab^{3}c^{2}d + 3\, a^{2}b^{2}cd^{2} - a^{3}bd^{3})g^{4}} - \frac{6\, d^{3}\log(dx+c)}{(b^{4}c^{3} - 3\, ab^{3}c^{2}d + 3\, a^{2}b^{2}cd^{2} - a^{3}bd^{3})g^{4}}\right) - \frac{1}{36}\, iBdn\left(\frac{5\, ab^{2}c^{2} - 22\, a^{2}bcd + 5\, a^{3}d^{2} - 6\,(3\, b^{3}cd - ab^{2}d^{2})x^{2} + 3\,(3\, b^{3}c^{2} - 16\, ab^{2}cd + 5\, a^{2}bd^{2})x}{(b^{7}c^{2} - 2\, ab^{6}cd + a^{2}b^{5}d^{2})g^{4}x^{3} + 3\,(ab^{6}c^{2} - 2\, a^{2}b^{5}cd + a^{3}b^{4}d^{2})g^{4}x^{2} + 3\,(a^{2}b^{5}c^{2} - 2\, a^{3}b^{4}cd + a^{4}b^{3}d^{2})g^{4}x + (a^{3}b^{4}c^{2} - 2\, a^{4}b^{3}cd + a^{5}b^{2}d^{2})g^{4}} - \frac{6\,(3\, bcd^{2} - ad^{3})\log(bx+a)}{(b^{5}c^{3} - 3\, ab^{4}c^{2}d + 3\, a^{2}b^{3}cd^{2} - a^{3}b^{2}d^{3})g^{4}} + \frac{6\,(3\, bcd^{2} - ad^{3})\log(dx+c)}{(b^{5}c^{3} - 3\, ab^{4}c^{2}d + 3\, a^{2}b^{3}cd^{2} - a^{3}b^{2}d^{3})g^{4}}\right) - \frac{i\,(3\, bx + a)Bd\log\left(\left(\frac{bx}{dx+c} + \frac{a}{dx+c}\right)^{n} e\right)}{6\,(b^{5}g^{4}x^{3} + 3\, ab^{4}g^{4}x^{2} + 3\, a^{2}b^{3}g^{4}x + a^{3}b^{2}g^{4})} - \frac{i\,(3\, bx + a)Ad}{6\,(b^{5}g^{4}x^{3} + 3\, ab^{4}g^{4}x^{2} + 3\, a^{2}b^{3}g^{4}x + a^{3}b^{2}g^{4})} - \frac{iBc\log\left(\left(\frac{bx}{dx+c} + \frac{a}{dx+c}\right)^{n} e\right)}{3\,(b^{4}g^{4}x^{3} + 3\, ab^{3}g^{4}x^{2} + 3\, a^{2}b^{2}g^{4}x + a^{3}bg^{4})} - \frac{iAc}{3\,(b^{4}g^{4}x^{3} + 3\, ab^{3}g^{4}x^{2} + 3\, a^{2}b^{2}g^{4}x + a^{3}bg^{4})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, alg
orithm="maxima")
```

```
[Out] -1/18*I*B*c*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2
*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*
b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3
*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4)
+ 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^
3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
a^3*b*d^3)*g^4)) - 1/36*I*B*d*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 -
6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*
x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^
5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2
)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 -
 a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*
d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d +
3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/6*I*(3*b*x + a)*B*d*log((b*x/(d*x
+ c) + a/(d*x + c))^n*e)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x +
 a^3*b^2*g^4) - 1/6*I*(3*b*x + a)*A*d/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^
2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*I*B*c*log((b*x/(d*x + c) + a/(d*x + c))^n*
e)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*I*A*
c/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 435 vs. $2(171) = 342$.
time = 0.40, size = 435, normalized size = 2.40

$$-\frac{12\,(i\,A+i\,B)b^3c^3+18\,(-i\,A-i\,B)ab^2c^2d+6\,(i\,A+i\,B)a^3d^3+6\,(-i\,Bb^3cd^2+i\,Bab^2d^3)nx^2-(-4i\,Bb^3c^3+9i\,Bab^2c^2d-5i\,Ba^3d^3)n+3\,(6\,(i\,A+i\,B)b^3c^2d+12\,(-i\,A-i\,B)ab^2cd^2+6\,(i\,A+i\,B)a^2bd^3+(i\,Bb^3c^2d-6i\,Bab^2cd^2+5i\,Ba^2bd^3)n)x+6\,(-i\,Bb^3d^3nx^3-3i\,Bab^2d^3nx^2+3\,(i\,Bb^3c^2d-2i\,Bab^2cd^2)nx+(2i\,Bb^3c^3-3i\,Bab^2c^2d)n)\log\left(\frac{bx+a}{dx+c}\right)}{36\,((b^7c^2-2\,ab^6cd+a^2b^5d^2)g^4x^3+3\,(ab^6c^2-2\,a^2b^5cd+a^3b^4d^2)g^4x^2+3\,(a^2b^5c^2-2\,a^3b^4cd+a^4b^3d^2)g^4x+(a^3b^4c^2-2\,a^4b^3cd+a^5b^2d^2)g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, alg
orithm="fricas")
```

```
[Out] -1/36*(12*(I*A + I*B)*b^3*c^3 + 18*(-I*A - I*B)*a*b^2*c^2*d + 6*(I*A + I*B)
*a^3*d^3 + 6*(-I*B*b^3*c*d^2 + I*B*a*b^2*d^3)*n*x^2 - (-4*I*B*b^3*c^3 + 9*I
*B*a*b^2*c^2*d - 5*I*B*a^3*d^3)*n + 3*(6*(I*A + I*B)*b^3*c^2*d + 12*(-I*A -
 I*B)*a*b^2*c*d^2 + 6*(I*A + I*B)*a^2*b*d^3 + (I*B*b^3*c^2*d - 6*I*B*a*b^2*
c*d^2 + 5*I*B*a^2*b*d^3)*n)*x + 6*(-I*B*b^3*d^3*n*x^3 - 3*I*B*a*b^2*d^3*n*x
^2 + 3*(I*B*b^3*c^2*d - 2*I*B*a*b^2*c*d^2)*n*x + (2*I*B*b^3*c^3 - 3*I*B*a*b
^2*c^2*d)*n)*log((b*x + a)/(d*x + c)))/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^
2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b
^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d
+ a^5*b^2*d^2)*g^4)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4,x)
```

```
[Out] Timed out
```

Giac [A]
time = 4.92, size = 234, normalized size = 1.29

$$-\frac{1}{36}\left(\frac{6\left(2i\,Bbn-\frac{3\,(i\,bx+i\,a)Bdn}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^3bcg^4}{(dx+c)^3}-\frac{(bx+a)^3adg^4}{(dx+c)^3}}+\frac{4i\,Bbn-\frac{9\,(i\,bx+i\,a)Bdn}{dx+c}+12i\,Ab+12i\,Bb-\frac{18\,(i\,bx+i\,a)Ad}{dx+c}-\frac{18\,(i\,bx+i\,a)Bd}{dx+c}}{\frac{(bx+a)^3bcg^4}{(dx+c)^3}-\frac{(bx+a)^3adg^4}{(dx+c)^3}}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, alg
orithm="giac")
```

```
[Out] -1/36*(6*(2*I*B*b*n - 3*(I*b*x + I*a)*B*d*n/(d*x + c))*log((b*x + a)/(d*x +
 c))/((b*x + a)^3*b*c*g^4/(d*x + c)^3 - (b*x + a)^3*a*d*g^4/(d*x + c)^3) +
(4*I*B*b*n - 9*(I*b*x + I*a)*B*d*n/(d*x + c) + 12*I*A*b + 12*I*B*b - 18*(I*
b*x + I*a)*A*d/(d*x + c) - 18*(I*b*x + I*a)*B*d/(d*x + c))/((b*x + a)^3*b*c
```

```
*g^4/(d*x + c)^3 - (b*x + a)^3*a*d*g^4/(d*x + c)^3))*(b*c/(b*c - a*d)^2 - a
*d/(b*c - a*d)^2)
```

Mupad [B]
time = 5.28, size = 374, normalized size = 2.07

$$-\frac{\frac{6\,A\,a^2\,d^2\,i-12\,A\,b^2\,c^2\,i+5\,B\,a^2\,d^2\,i\,n-4\,B\,b^2\,c^2\,i\,n+6\,A\,a\,b\,c\,d\,i+5\,B\,a\,b\,c\,d\,i\,n}{6\,\left(a\,d-b\,c\right)}+\frac{x\,\left(6\,A\,a\,b\,d^2\,i-6\,A\,b^2\,c\,d\,i-B\,b^2\,c\,d\,i\,n+5\,B\,a\,b\,d^2\,i\,n\right)}{2\,\left(a\,d-b\,c\right)}+\frac{B\,b^2\,d^2\,i\,n\,x^2}{a\,d-b\,c}}{6\,a^3\,b^2\,g^4+18\,a^2\,b^3\,g^4\,x+18\,a\,b^4\,g^4\,x^2+6\,b^5\,g^4\,x^3}-\frac{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,\left(\frac{B\,c\,i}{3\,b}+\frac{B\,a\,d\,i}{6\,b^2}+\frac{B\,d\,i\,x}{2\,b}\right)}{a^3\,g^4+3\,a^2\,b\,g^4\,x+3\,a\,b^2\,g^4\,x^2+b^3\,g^4\,x^3}-\frac{B\,d^3\,i\,n\,\mathrm{atanh}\left(\frac{6\,b^4\,c^2\,g^4-6\,a^2\,b^2\,d^2\,g^4}{6\,b^2\,g^4\,{\left(a\,d-b\,c\right)}^2}-\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{3\,b^2\,g^4\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^4,
x)
```

```
[Out] - ((6*A*a^2*d^2*i - 12*A*b^2*c^2*i + 5*B*a^2*d^2*i*n - 4*B*b^2*c^2*i*n + 6*
A*a*b*c*d*i + 5*B*a*b*c*d*i*n)/(6*(a*d - b*c)) + (x*(6*A*a*b*d^2*i - 6*A*b^
2*c*d*i - B*b^2*c*d*i*n + 5*B*a*b*d^2*i*n))/(2*(a*d - b*c)) + (B*b^2*d^2*i*
n*x^2)/(a*d - b*c))/(6*a^3*b^2*g^4 + 6*b^5*g^4*x^3 + 18*a^2*b^3*g^4*x + 18*
a*b^4*g^4*x^2) - (log(e*((a + b*x)/(c + d*x))^n)*((B*c*i)/(3*b) + (B*a*d*i)
/(6*b^2) + (B*d*i*x)/(2*b)))/(a^3*g^4 + b^3*g^4*x^3 + 3*a*b^2*g^4*x^2 + 3*a
^2*b*g^4*x) - (B*d^3*i*n*atanh((6*b^4*c^2*g^4 - 6*a^2*b^2*d^2*g^4)/(6*b^2*g
^4*(a*d - b*c)^2) - (2*b*d*x)/(a*d - b*c)))/(3*b^2*g^4*(a*d - b*c)^2)
```

3.116 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=281

$$-\frac{Bd^2in(c+dx)^2}{4(bc-ad)^3g^5(a+bx)^2}+\frac{2bBdin(c+dx)^3}{9(bc-ad)^3g^5(a+bx)^3}-\frac{b^2Bin(c+dx)^4}{16(bc-ad)^3g^5(a+bx)^4}-\frac{d^2i(c+dx)^2\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{2(bc-ad)^3g^5(a+bx)^2}$$

```
[Out] -1/4*B*d^2*i*n*(d*x+c)^2/(-a*d+b*c)^3/g^5/(b*x+a)^2+2/9*b*B*d*i*n*(d*x+c)^3
/(-a*d+b*c)^3/g^5/(b*x+a)^3-1/16*b^2*B*i*n*(d*x+c)^4/(-a*d+b*c)^3/g^5/(b*x+
a)^4-1/2*d^2*i*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^5/(
b*x+a)^2+2/3*b*d*i*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g
^5/(b*x+a)^3-1/4*b^2*i*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)
^3/g^5/(b*x+a)^4
```

Rubi [A]
time = 0.13, antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.122$, Rules used = {2561, 45, 2372, 12, 14}

$$-\frac{b^2i(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^3}-\frac{d^2i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^5(a+bx)^2(bc-ad)^3}+\frac{2bdi(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^3}-\frac{b^2Bin(c+dx)^4}{16g^5(a+bx)^4(bc-ad)^3}-\frac{Bd^2in(c+dx)^2}{4g^5(a+bx)^2(bc-ad)^3}+\frac{2bBdin(c+dx)^3}{9g^5(a+bx)^3(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^5,
x]
```

```
[Out] -1/4*(B*d^2*i*n*(c + d*x)^2)/((b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*B*d*i*n
*(c + d*x)^3)/(9*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*B*i*n*(c + d*x)^4)/(
16*(b*c - a*d)^3*g^5*(a + b*x)^4) - (d^2*i*(c + d*x)^2*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*d*i*(c + d*x)^
3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^3*g^5*(a + b*x)^3)
 - (b^2*i*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*(b*c - a*d
)^3*g^5*(a + b*x)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(116c+116dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}\,dx = \int \left(\frac{116(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^5(a+bx)^5} + \frac{116d\left(A+B\right.}{bg^5(a}\right.$$

$$= \frac{(116d)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^4}\,dx}{bg^5} + \frac{(116(bc-ad))\int \frac{A+B\log\left(e\right.}{(a+b}}{bg^5}$$

$$= -\frac{29(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^5(a+bx)^4} - \frac{116d\left(A+B\log\left(\right.\right.}{3b^2g^5(a+}$$

$$= -\frac{29(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^5(a+bx)^4} - \frac{116d\left(A+B\log\left(\right.\right.}{3b^2g^5(a+}$$

$$= -\frac{29(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^5(a+bx)^4} - \frac{116d\left(A+B\log\left(\right.\right.}{3b^2g^5(a+}$$

$$= -\frac{29B(bc-ad)n}{4b^2g^5(a+bx)^4} - \frac{29Bdn}{9b^2g^5(a+bx)^3} + \frac{29Bd^2n}{6b^2(bc-ad)g^5(a+b}$$

Mathematica [A]

time = 0.34, size = 220, normalized size = 0.78

$$-\frac{i\left(\frac{36Abc}{(a+bx)^4}-\frac{36aAd}{(a+bx)^4}+\frac{9bBcn}{(a+bx)^4}-\frac{9aBdn}{(a+bx)^4}+\frac{48Ad}{(a+bx)^3}+\frac{4Bdn}{(a+bx)^3}-\frac{6Bd^2n}{(bc-ad)(a+bx)^2}+\frac{12Bd^3n}{(bc-ad)^2(a+bx)}+\frac{12Bd^4n\log(a+bx)}{(bc-ad)^3}+\frac{12B(3bc+ad+4bdx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^4}-\frac{12Bd^4n\log(c+dx)}{(bc-ad)^3}\right)}{144b^2g^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x)^5,x]
```

```
[Out] -1/144*(i*((36*A*b*c)/(a + b*x)^4 - (36*a*A*d)/(a + b*x)^4 + (9*b*B*c*n)/(a
 + b*x)^4 - (9*a*B*d*n)/(a + b*x)^4 + (48*A*d)/(a + b*x)^3 + (4*B*d*n)/(a +
 b*x)^3 - (6*B*d^2*n)/((b*c - a*d)*(a + b*x)^2) + (12*B*d^3*n)/((b*c - a*d)
^2*(a + b*x)) + (12*B*d^4*n*Log[a + b*x])/(b*c - a*d)^3 + (12*B*(3*b*c + a*
d + 4*b*d*x)*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x)^4 - (12*B*d^4*n*Log[
c + d*x])/(b*c - a*d)^3))/(b^2*g^5)
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1394 vs. 2(266) = 532.
time = 0.34, size = 1394, normalized size = 4.96

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, alg
orithm="maxima")
```

```
[Out] 1/48*I*B*c*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2
 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*
d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^
5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4
*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^
3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b
^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^
3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2
```

```
 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*
b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/144*
I*B*d*n*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12
*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^
2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^
3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 +
4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6
*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 +
4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (
a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4
*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^
2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x +
c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^
2*d^4)*g^5)) - 1/12*I*(4*b*x + a)*B*d*log((b*x/(d*x + c) + a/(d*x + c))^n*e
)/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^
4*b^2*g^5) - 1/12*I*(4*b*x + a)*A*d/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*
b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/4*I*B*c*log((b*x/(d*x + c)
 + a/(d*x + c))^n*e)/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4
*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*I*A*c/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*
a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 709 vs. $2(266) = 532$.
time = 0.39, size = 709, normalized size = 2.52

$$\frac{36\,(-i\,A-i\,B)b^4c^4+96\,(i\,A+i\,B)ab^3c^3d+72\,(-i\,A-i\,B)a^2b^2c^2d^2+12\,(i\,A+i\,B)a^4d^4+12\,(-i\,Bb^4cd^3+i\,Bab^3d^4)nx^3+6\,(i\,Bb^4c^2d^2-8i\,Bab^3cd^3+7i\,Ba^2b^2d^4)nx^2-(9i\,Bb^4c^4-32i\,Bab^3c^3d+36i\,Ba^2b^2c^2d^2-13i\,Ba^4d^4)n+4\,(12\,(-i\,A-i\,B)b^4c^3d+36\,(i\,A+i\,B)ab^3c^2d^2+36\,(-i\,A-i\,B)a^2b^2cd^3+12\,(i\,A+i\,B)a^3bd^4+(-i\,Bb^4c^3d+6i\,Bab^3c^2d^2-18i\,Ba^2b^2cd^3+13i\,Ba^3bd^4)n)x+12\,(-i\,Bb^4d^4nx^4-4i\,Bab^3d^4nx^3-6i\,Ba^2b^2d^4nx^2+4\,(-i\,Bb^4c^3d+3i\,Bab^3c^2d^2-3i\,Ba^2b^2cd^3)nx+(-3i\,Bb^4c^4+8i\,Bab^3c^3d-6i\,Ba^2b^2c^2d^2)n)\log\left(\frac{bx+a}{dx+c}\right)}{144\,((b^9c^3-3\,ab^8c^2d+3\,a^2b^7cd^2-a^3b^6d^3)g^5x^4+4\,(ab^8c^3-3\,a^2b^7c^2d+3\,a^3b^6cd^2-a^4b^5d^3)g^5x^3+6\,(a^2b^7c^3-3\,a^3b^6c^2d+3\,a^4b^5cd^2-a^5b^4d^3)g^5x^2+4\,(a^3b^6c^3-3\,a^4b^5c^2d+3\,a^5b^4cd^2-a^6b^3d^3)g^5x+(a^4b^5c^3-3\,a^5b^4c^2d+3\,a^6b^3cd^2-a^7b^2d^3)g^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, alg
orithm="fricas")
```

```
[Out] 1/144*(36*(-I*A - I*B)*b^4*c^4 + 96*(I*A + I*B)*a*b^3*c^3*d + 72*(-I*A - I*
B)*a^2*b^2*c^2*d^2 + 12*(I*A + I*B)*a^4*d^4 + 12*(-I*B*b^4*c*d^3 + I*B*a*b^
3*d^4)*n*x^3 + 6*(I*B*b^4*c^2*d^2 - 8*I*B*a*b^3*c*d^3 + 7*I*B*a^2*b^2*d^4)*
n*x^2 - (9*I*B*b^4*c^4 - 32*I*B*a*b^3*c^3*d + 36*I*B*a^2*b^2*c^2*d^2 - 13*I
*B*a^4*d^4)*n + 4*(12*(-I*A - I*B)*b^4*c^3*d + 36*(I*A + I*B)*a*b^3*c^2*d^2
 + 36*(-I*A - I*B)*a^2*b^2*c*d^3 + 12*(I*A + I*B)*a^3*b*d^4 + (-I*B*b^4*c^3
*d + 6*I*B*a*b^3*c^2*d^2 - 18*I*B*a^2*b^2*c*d^3 + 13*I*B*a^3*b*d^4)*n)*x +
12*(-I*B*b^4*d^4*n*x^4 - 4*I*B*a*b^3*d^4*n*x^3 - 6*I*B*a^2*b^2*d^4*n*x^2 +
4*(-I*B*b^4*c^3*d + 3*I*B*a*b^3*c^2*d^2 - 3*I*B*a^2*b^2*c*d^3)*n*x + (-3*I*
B*b^4*c^4 + 8*I*B*a*b^3*c^3*d - 6*I*B*a^2*b^2*c^2*d^2)*n)*log((b*x + a)/(d*
x + c)))/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4
 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3
+ 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2
 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x
+ (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

$$\text{Timed out}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.41, size = 388, normalized size = 1.38

$$\frac{1}{144}\left(\frac{12\left(-3i\,Bb^2n-\frac{8(-ibx-ia)Bbdn}{dx+c}-\frac{6i(bx+a)^2Bd^2n}{(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^4b^2c^2g^5}{(dx+c)^4}-\frac{2(bx+a)^4abcdg^5}{(dx+c)^4}+\frac{(bx+a)^4a^2d^2g^5}{(dx+c)^4}}+\frac{-9i\,Bb^2n-\frac{32(-ibx-ia)Bbdn}{dx+c}-\frac{36i(bx+a)^2Bd^2n}{(dx+c)^2}-36i\,Ab^2-36i\,Bb^2-\frac{96(-ibx-ia)Abd}{dx+c}-\frac{96(-ibx-ia)Bbd}{dx+c}-\frac{72i(bx+a)^2Ad^2}{(dx+c)^2}-\frac{72i(bx+a)^2Bd^2}{(dx+c)^2}}{\frac{(bx+a)^4b^2c^2g^5}{(dx+c)^4}-\frac{2(bx+a)^4abcdg^5}{(dx+c)^4}+\frac{(bx+a)^4a^2d^2g^5}{(dx+c)^4}}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, alg
orithm="giac")
```

```
[Out] 1/144*(12*(-3*I*B*b^2*n - 8*(-I*b*x - I*a)*B*b*d*n/(d*x + c) - 6*I*(b*x + a
)^2*B*d^2*n/(d*x + c)^2)*log((b*x + a)/(d*x + c))/((b*x + a)^4*b^2*c^2*g^5/
(d*x + c)^4 - 2*(b*x + a)^4*a*b*c*d*g^5/(d*x + c)^4 + (b*x + a)^4*a^2*d^2*g
^5/(d*x + c)^4) + (-9*I*B*b^2*n - 32*(-I*b*x - I*a)*B*b*d*n/(d*x + c) - 36*
I*(b*x + a)^2*B*d^2*n/(d*x + c)^2 - 36*I*A*b^2 - 36*I*B*b^2 - 96*(-I*b*x -
I*a)*A*b*d/(d*x + c) - 96*(-I*b*x - I*a)*B*b*d/(d*x + c) - 72*I*(b*x + a)^2
*A*d^2/(d*x + c)^2 - 72*I*(b*x + a)^2*B*d^2/(d*x + c)^2)/((b*x + a)^4*b^2*c
^2*g^5/(d*x + c)^4 - 2*(b*x + a)^4*a*b*c*d*g^5/(d*x + c)^4 + (b*x + a)^4*a^
2*d^2*g^5/(d*x + c)^4))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 5.87, size = 610, normalized size = 2.17

$$\frac{B\,d^4\,i\,n\,\mathrm{atanh}\left(\frac{12\,a^3\,b^2\,d^3\,g^5-12\,a^2\,b^3\,c\,d^2\,g^5-12\,a\,b^4\,c^2\,d\,g^5+12\,b^5\,c^3\,g^5}{12\,b^2\,g^5\,(a\,d-b\,c)^3}+\frac{2\,b\,d\,x\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}{(a\,d-b\,c)^3}\right)}{6\,b^2\,g^5\,(a\,d-b\,c)^3}-\frac{\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\,\left(\frac{B\,c\,i}{4\,b}+\frac{B\,a\,d\,i}{12\,b^2}+\frac{B\,d\,i\,x}{3\,b}\right)}{a^4\,g^5+4\,a^3\,b\,g^5\,x+6\,a^2\,b^2\,g^5\,x^2+4\,a\,b^3\,g^5\,x^3+b^4\,g^5\,x^4}-\frac{\frac{12\,A\,a^3\,d^3\,i+36\,A\,b^3\,c^3\,i+13\,B\,a^3\,d^3\,i\,n+9\,B\,b^3\,c^3\,i\,n-60\,A\,a\,b^2\,c^2\,d\,i+12\,A\,a^2\,b\,c\,d^2\,i-23\,B\,a\,b^2\,c^2\,d\,i\,n+13\,B\,a^2\,b\,c\,d^2\,i\,n}{12\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}+\frac{x\,(12\,A\,a^2\,b\,d^3\,i+12\,A\,b^3\,c^2\,d\,i-24\,A\,a\,b^2\,c\,d^2\,i+13\,B\,a^2\,b\,d^3\,i\,n+B\,b^3\,c^2\,d\,i\,n-5\,B\,a\,b^2\,c\,d^2\,i\,n)}{3\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}-\frac{d\,x^2\,(B\,b^3\,c\,d\,i\,n-7\,B\,a\,b^2\,d^2\,i\,n)}{2\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}+\frac{B\,b^3\,d^3\,i\,n\,x^3}{a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2}}{12\,a^4\,b^2\,g^5+48\,a^3\,b^3\,g^5\,x+72\,a^2\,b^4\,g^5\,x^2+48\,a\,b^5\,g^5\,x^3+12\,b^6\,g^5\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^5,
x)
```

```
[Out] (B*d^4*i*n*atanh((12*b^5*c^3*g^5 + 12*a^3*b^2*d^3*g^5 - 12*a*b^4*c^2*d*g^5
- 12*a^2*b^3*c*d^2*g^5)/(12*b^2*g^5*(a*d - b*c)^3) + (2*b*d*x*(a^2*d^2 + b^
2*c^2 - 2*a*b*c*d))/(a*d - b*c)^3))/(6*b^2*g^5*(a*d - b*c)^3) - (log(e*((a
+ b*x)/(c + d*x))^n)*((B*c*i)/(4*b) + (B*a*d*i)/(12*b^2) + (B*d*i*x)/(3*b))
)/(a^4*g^5 + b^4*g^5*x^4 + 4*a*b^3*g^5*x^3 + 6*a^2*b^2*g^5*x^2 + 4*a^3*b*g^
5*x) - ((12*A*a^3*d^3*i + 36*A*b^3*c^3*i + 13*B*a^3*d^3*i*n + 9*B*b^3*c^3*i
*n - 60*A*a*b^2*c^2*d*i + 12*A*a^2*b*c*d^2*i - 23*B*a*b^2*c^2*d*i*n + 13*B*
```

```
a^2*b*c*d^2*i*n)/(12*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (x*(12*A*a^2*b*d^3*
i + 12*A*b^3*c^2*d*i - 24*A*a*b^2*c*d^2*i + 13*B*a^2*b*d^3*i*n + B*b^3*c^2*
d*i*n - 5*B*a*b^2*c*d^2*i*n))/(3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (d*x^2*
(B*b^3*c*d*i*n - 7*B*a*b^2*d^2*i*n))/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) +
(B*b^3*d^3*i*n*x^3)/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))/(12*a^4*b^2*g^5 + 12*b
^6*g^5*x^4 + 48*a^3*b^3*g^5*x + 48*a*b^5*g^5*x^3 + 72*a^2*b^4*g^5*x^2)
```

3.117 $\int (ag+bgx)^3(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=442

$$\frac{B(bc-ad)^5g^3i^2nx}{60b^2d^3}+\frac{B(bc-ad)^4g^3i^2n(c+dx)^2}{120bd^4}-\frac{19B(bc-ad)^3g^3i^2n(c+dx)^3}{180d^4}+\frac{13bB(bc-ad)^2g^3i^2n(c+d}{120d^4}$$

```
[Out] 1/60*B*(-a*d+b*c)^5*g^3*i^2*n*x/b^2/d^3+1/120*B*(-a*d+b*c)^4*g^3*i^2*n*(d*x
+c)^2/b/d^4-19/180*B*(-a*d+b*c)^3*g^3*i^2*n*(d*x+c)^3/d^4+13/120*b*B*(-a*d+
b*c)^2*g^3*i^2*n*(d*x+c)^4/d^4-1/30*b^2*B*(-a*d+b*c)*g^3*i^2*n*(d*x+c)^5/d^
4-1/3*(-a*d+b*c)^3*g^3*i^2*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^4+3/
4*b*(-a*d+b*c)^2*g^3*i^2*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^4-3/5*
b^2*(-a*d+b*c)*g^3*i^2*(d*x+c)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^4+1/6*b^
3*g^3*i^2*(d*x+c)^6*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^4+1/60*B*(-a*d+b*c)^6
*g^3*i^2*n*ln((b*x+a)/(d*x+c))/b^3/d^4+1/60*B*(-a*d+b*c)^6*g^3*i^2*n*ln(d*x
+c)/b^3/d^4
```

Rubi [A]
time = 0.30, antiderivative size = 442, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.116$, Rules used = {2561, 45, 2382, 12, 1634}

$$\frac{b^3g^3i^2(c+dx)^6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6d^4}-\frac{3b^2g^3i^2(c+dx)^5(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d^4}-\frac{g^3i^2(c+dx)^3(bc-ad)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d^4}+\frac{3bg^3i^2(c+dx)^4(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^4}+\frac{Bg^3i^2n(bc-ad)^6\log\left(\frac{a+bx}{c+dx}\right)}{60b^3d^4}+\frac{Bg^3i^2n(bc-ad)^6\log(c+dx)}{60b^3d^4}-\frac{b^2Bg^3i^2n(c+dx)^5(bc-ad)}{30d^4}+\frac{Bg^3i^2nx(bc-ad)^5}{60b^2d^3}+\frac{Bg^3i^2n(c+dx)^2(bc-ad)^4}{120bd^4}-\frac{19Bg^3i^2n(c+dx)^3(bc-ad)^3}{180d^4}+\frac{13bBg^3i^2n(c+dx)^4(bc-ad)^2}{120d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),
x]
```

```
[Out] (B*(b*c - a*d)^5*g^3*i^2*n*x)/(60*b^2*d^3) + (B*(b*c - a*d)^4*g^3*i^2*n*(c
+ d*x)^2)/(120*b*d^4) - (19*B*(b*c - a*d)^3*g^3*i^2*n*(c + d*x)^3)/(180*d^4
) + (13*b*B*(b*c - a*d)^2*g^3*i^2*n*(c + d*x)^4)/(120*d^4) - (b^2*B*(b*c -
a*d)*g^3*i^2*n*(c + d*x)^5)/(30*d^4) - ((b*c - a*d)^3*g^3*i^2*(c + d*x)^3*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^4) + (3*b*(b*c - a*d)^2*g^3*i^2
*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^4) - (3*b^2*(b*c
- a*d)*g^3*i^2*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^4)
+ (b^3*g^3*i^2*(c + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d^4)
+ (B*(b*c - a*d)^6*g^3*i^2*n*Log[(a + b*x)/(c + d*x)])/(60*b^3*d^4) + (B*(b
*c - a*d)^6*g^3*i^2*n*Log[c + d*x])/(60*b^3*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (117c+117dx)^2(ag+bgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx = \int \left(\frac{13689(bc-ad)^2(ag+bgx)^3 (A+B}{b^2}\right.$$

$$= \frac{(13689(bc-ad)^2) \int (ag+bgx)^3 (A+B\,\mathrm{l}}{b^2}$$

$$= \frac{13689(bc-ad)^2 g^3 (a+bx)^4 (A+B\log(}{4b^3}$$

$$= \frac{13689(bc-ad)^2 g^3 (a+bx)^4 (A+B\log(}{4b^3}$$

$$= \frac{13689(bc-ad)^2 g^3 (a+bx)^4 (A+B\log(}{4b^3}$$

$$= -\frac{4563B(bc-ad)^5 g^3 nx}{20b^2d^3} + \frac{4563B(bc-a}{40}$$

Mathematica [A]
time = 0.26, size = 441, normalized size = 1.00

$$\frac{g^3 i^2 \left(90d^4(bc-ad)^2(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+144d^5(bc-ad)(a+bx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+60d^6(a+bx)^6\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-15B(bc-ad)^3n\left(6bd(bc-ad)^2x+3d^2(-bc+ad)(a+bx)^2+2d^3(a+bx)^3-6(bc-ad)^3\log(c+dx)\right)+12B(bc-ad)^2n\left(12bd(bc-ad)^3x-6d^2(bc-ad)^2(a+bx)^2+4d^3(bc-ad)(a+bx)^3-3d^4(a+bx)^4-12(bc-ad)^4\log(c+dx)\right)-B(bc-ad)n\left(60bd(bc-ad)^4x+30d^2(-bc+ad)^3(a+bx)^2+20d^3(bc-ad)^2(a+bx)^3+15d^4(-bc+ad)(a+bx)^4+12d^5(a+bx)^5-60(bc-ad)^5\log(c+dx)\right)\right)}{360b^3d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]),x]
```

```
[Out] (g^3*i^2*(90*d^4*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) + 144*d^5*(b*c - a*d)*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]) + 60*d^6*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 15*B*(b*
c - a*d)^3*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*
d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^2*n*(12*
b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(
a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) - B*(b*c -
a*d)*n*(60*b*d*(b*c - a*d)^4*x + 30*d^2*(-(b*c) + a*d)^3*(a + b*x)^2 + 20*d
^3*(b*c - a*d)^2*(a + b*x)^3 + 15*d^4*(-(b*c) + a*d)*(a + b*x)^4 + 12*d^5*(
a + b*x)^5 - 60*(b*c - a*d)^5*Log[c + d*x])))/(360*b^3*d^4)
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^3 \left(dix+ci\right)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1889 vs. $2(391) = 782$.
time = 0.32, size = 1889, normalized size = 4.27

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="maxima")
[Out] -1/6*B*b^3*d^2*g^3*x^6*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/6*A*b^3*d
^2*g^3*x^6 - 2/5*B*b^3*c*d*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) -
 3/5*B*a*b^2*d^2*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2/5*A*b^3
*c*d*g^3*x^5 - 3/5*A*a*b^2*d^2*g^3*x^5 - 1/4*B*b^3*c^2*g^3*x^4*log((b*x/(d*
x + c) + a/(d*x + c))^n*e) - 3/2*B*a*b^2*c*d*g^3*x^4*log((b*x/(d*x + c) + a
/(d*x + c))^n*e) - 3/4*B*a^2*b*d^2*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c)
)^n*e) - 1/4*A*b^3*c^2*g^3*x^4 - 3/2*A*a*b^2*c*d*g^3*x^4 - 3/4*A*a^2*b*d^2*
g^3*x^4 - B*a*b^2*c^2*g^3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2*B*
a^2*b*c*d*g^3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/3*B*a^3*d^2*g^
3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - A*a*b^2*c^2*g^3*x^3 - 2*A*a^
2*b*c*d*g^3*x^3 - 1/3*A*a^3*d^2*g^3*x^3 - 3/2*B*a^2*b*c^2*g^3*x^2*log((b*x/
(d*x + c) + a/(d*x + c))^n*e) - B*a^3*c*d*g^3*x^2*log((b*x/(d*x + c) + a/(d
*x + c))^n*e) - 3/2*A*a^2*b*c^2*g^3*x^2 - A*a^3*c*d*g^3*x^2 + 1/360*B*b^3*d
^2*g^3*n*(60*a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^
4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 -
 a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)
*x)/(b^5*d^5)) - 1/30*B*b^3*c*d*g^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log
(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d
^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^
4)) - 1/20*B*a*b^2*d^2*g^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)
/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 +
 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) + 1/2
4*B*b^3*c^2*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^
3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3
*d^3)*x)/(b^3*d^3)) + 1/4*B*a*b^2*c*d*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4
*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d
^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/8*B*a^2*b*d^2*g^3*n*(6*a^
4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^
3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1
/2*B*a*b^2*c^2*g^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b
^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - B*a^2*b*c*d*g
^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2
```

```
)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 1/6*B*a^3*d^2*g^3*n*(2*a^3*lo
g(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2
*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 3/2*B*a^2*b*c^2*g^3*n*(a^2*log(b*x + a)/b^2
 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a^3*c*d*g^3*n*(a^2*log(b
*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - B*a^3*c^2*g^3*n
*(a*log(b*x + a)/b - c*log(d*x + c)/d) - B*a^3*c^2*g^3*x*log((b*x/(d*x + c)
 + a/(d*x + c))^n*e) - A*a^3*c^2*g^3*x
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 837 vs. $2(391) = 782$.
time = 0.56, size = 837, normalized size = 1.89

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="fricas")
```

```
[Out] -1/360*(60*(A + B)*b^6*d^6*g^3*x^6 - 12*((B*b^6*c*d^5 - B*a*b^5*d^6)*g^3*n
- 6*(2*(A + B)*b^6*c*d^5 + 3*(A + B)*a*b^5*d^6)*g^3)*x^5 + 6*(15*B*a^4*b^2*
c^2*d^4 - 6*B*a^5*b*c*d^5 + B*a^6*d^6)*g^3*n*log((b*x + a)/b) + 6*(B*b^6*c^
6 - 6*B*a*b^5*c^5*d + 15*B*a^2*b^4*c^4*d^2 - 20*B*a^3*b^3*c^3*d^3)*g^3*n*lo
g((d*x + c)/d) - 3*((7*B*b^6*c^2*d^4 + 6*B*a*b^5*c*d^5 - 13*B*a^2*b^4*d^6)*
g^3*n - 30*((A + B)*b^6*c^2*d^4 + 6*(A + B)*a*b^5*c*d^5 + 3*(A + B)*a^2*b^4
*d^6)*g^3)*x^4 - 2*((B*b^6*c^3*d^3 + 39*B*a*b^5*c^2*d^4 - 21*B*a^2*b^4*c*d^
5 - 19*B*a^3*b^3*d^6)*g^3*n - 60*(3*(A + B)*a*b^5*c^2*d^4 + 6*(A + B)*a^2*b
^4*c*d^5 + (A + B)*a^3*b^3*d^6)*g^3)*x^3 + 3*((B*b^6*c^4*d^2 - 6*B*a*b^5*c^
3*d^3 - 30*B*a^2*b^4*c^2*d^4 + 34*B*a^3*b^3*c*d^5 + B*a^4*b^2*d^6)*g^3*n +
60*(3*(A + B)*a^2*b^4*c^2*d^4 + 2*(A + B)*a^3*b^3*c*d^5)*g^3)*x^2 + 6*(60*(
A + B)*a^3*b^3*c^2*d^4*g^3 - (B*b^6*c^5*d - 6*B*a*b^5*c^4*d^2 + 15*B*a^2*b^
4*c^3*d^3 - 5*B*a^3*b^3*c^2*d^4 - 6*B*a^4*b^2*c*d^5 + B*a^5*b*d^6)*g^3*n)*x
 + 6*(10*B*b^6*d^6*g^3*n*x^6 + 60*B*a^3*b^3*c^2*d^4*g^3*n*x + 12*(2*B*b^6*c
*d^5 + 3*B*a*b^5*d^6)*g^3*n*x^5 + 15*(B*b^6*c^2*d^4 + 6*B*a*b^5*c*d^5 + 3*B
*a^2*b^4*d^6)*g^3*n*x^4 + 20*(3*B*a*b^5*c^2*d^4 + 6*B*a^2*b^4*c*d^5 + B*a^3
*b^3*d^6)*g^3*n*x^3 + 30*(3*B*a^2*b^4*c^2*d^4 + 2*B*a^3*b^3*c*d^5)*g^3*n*x^
2)*log((b*x + a)/(d*x + c)))/(b^3*d^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 4589 vs. $2(391) = 782$.
time = 5.19, size = 4589, normalized size = 10.38

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="giac")
```

```
[Out] 1/360*(6*(B*b^10*c^7*g^3*n - 7*B*a*b^9*c^6*d*g^3*n - 6*(b*x + a)*B*b^9*c^7*
d*g^3*n/(d*x + c) + 21*B*a^2*b^8*c^5*d^2*g^3*n + 42*(b*x + a)*B*a*b^8*c^6*d
^2*g^3*n/(d*x + c) + 15*(b*x + a)^2*B*b^8*c^7*d^2*g^3*n/(d*x + c)^2 - 35*B*
a^3*b^7*c^4*d^3*g^3*n - 126*(b*x + a)*B*a^2*b^7*c^5*d^3*g^3*n/(d*x + c) - 1
05*(b*x + a)^2*B*a*b^7*c^6*d^3*g^3*n/(d*x + c)^2 - 20*(b*x + a)^3*B*b^7*c^7
*d^3*g^3*n/(d*x + c)^3 + 35*B*a^4*b^6*c^3*d^4*g^3*n + 210*(b*x + a)*B*a^3*b
^6*c^4*d^4*g^3*n/(d*x + c) + 315*(b*x + a)^2*B*a^2*b^6*c^5*d^4*g^3*n/(d*x +
 c)^2 + 140*(b*x + a)^3*B*a*b^6*c^6*d^4*g^3*n/(d*x + c)^3 - 21*B*a^5*b^5*c^
2*d^5*g^3*n - 210*(b*x + a)*B*a^4*b^5*c^3*d^5*g^3*n/(d*x + c) - 525*(b*x +
a)^2*B*a^3*b^5*c^4*d^5*g^3*n/(d*x + c)^2 - 420*(b*x + a)^3*B*a^2*b^5*c^5*d^
5*g^3*n/(d*x + c)^3 + 7*B*a^6*b^4*c*d^6*g^3*n + 126*(b*x + a)*B*a^5*b^4*c^2
*d^6*g^3*n/(d*x + c) + 525*(b*x + a)^2*B*a^4*b^4*c^3*d^6*g^3*n/(d*x + c)^2
+ 700*(b*x + a)^3*B*a^3*b^4*c^4*d^6*g^3*n/(d*x + c)^3 - B*a^7*b^3*d^7*g^3*n
 - 42*(b*x + a)*B*a^6*b^3*c*d^7*g^3*n/(d*x + c) - 315*(b*x + a)^2*B*a^5*b^3
*c^2*d^7*g^3*n/(d*x + c)^2 - 700*(b*x + a)^3*B*a^4*b^3*c^3*d^7*g^3*n/(d*x +
 c)^3 + 6*(b*x + a)*B*a^7*b^2*d^8*g^3*n/(d*x + c) + 105*(b*x + a)^2*B*a^6*b
^2*c*d^8*g^3*n/(d*x + c)^2 + 420*(b*x + a)^3*B*a^5*b^2*c^2*d^8*g^3*n/(d*x +
 c)^3 - 15*(b*x + a)^2*B*a^7*b*d^9*g^3*n/(d*x + c)^2 - 140*(b*x + a)^3*B*a^
6*b*c*d^9*g^3*n/(d*x + c)^3 + 20*(b*x + a)^3*B*a^7*d^10*g^3*n/(d*x + c)^3)*
log((b*x + a)/(d*x + c))/(b^6*d^4 - 6*(b*x + a)*b^5*d^5/(d*x + c) + 15*(b*x
 + a)^2*b^4*d^6/(d*x + c)^2 - 20*(b*x + a)^3*b^3*d^7/(d*x + c)^3 + 15*(b*x
+ a)^4*b^2*d^8/(d*x + c)^4 - 6*(b*x + a)^5*b*d^9/(d*x + c)^5 + (b*x + a)^6*
d^10/(d*x + c)^6) + (2*B*b^12*c^7*g^3*n - 14*B*a*b^11*c^6*d*g^3*n - 6*(b*x
+ a)*B*b^11*c^7*d*g^3*n/(d*x + c) + 42*B*a^2*b^10*c^5*d^2*g^3*n + 42*(b*x +
 a)*B*a*b^10*c^6*d^2*g^3*n/(d*x + c) - 3*(b*x + a)^2*B*b^10*c^7*d^2*g^3*n/(
d*x + c)^2 - 70*B*a^3*b^9*c^4*d^3*g^3*n - 126*(b*x + a)*B*a^2*b^9*c^5*d^3*g
^3*n/(d*x + c) + 21*(b*x + a)^2*B*a*b^9*c^6*d^3*g^3*n/(d*x + c)^2 + 34*(b*x
 + a)^3*B*b^9*c^7*d^3*g^3*n/(d*x + c)^3 + 70*B*a^4*b^8*c^3*d^4*g^3*n + 210*
(b*x + a)*B*a^3*b^8*c^4*d^4*g^3*n/(d*x + c) - 63*(b*x + a)^2*B*a^2*b^8*c^5*
d^4*g^3*n/(d*x + c)^2 - 238*(b*x + a)^3*B*a*b^8*c^6*d^4*g^3*n/(d*x + c)^3 -
 33*(b*x + a)^4*B*b^8*c^7*d^4*g^3*n/(d*x + c)^4 - 42*B*a^5*b^7*c^2*d^5*g^3*
n - 210*(b*x + a)*B*a^4*b^7*c^3*d^5*g^3*n/(d*x + c) + 105*(b*x + a)^2*B*a^3
*b^7*c^4*d^5*g^3*n/(d*x + c)^2 + 714*(b*x + a)^3*B*a^2*b^7*c^5*d^5*g^3*n/(d
*x + c)^3 + 231*(b*x + a)^4*B*a*b^7*c^6*d^5*g^3*n/(d*x + c)^4 + 6*(b*x + a)
^5*B*b^7*c^7*d^5*g^3*n/(d*x + c)^5 + 14*B*a^6*b^6*c*d^6*g^3*n + 126*(b*x +
```

```
a)*B*a^5*b^6*c^2*d^6*g^3*n/(d*x + c) - 105*(b*x + a)^2*B*a^4*b^6*c^3*d^6*g^
3*n/(d*x + c)^2 - 1190*(b*x + a)^3*B*a^3*b^6*c^4*d^6*g^3*n/(d*x + c)^3 - 69
3*(b*x + a)^4*B*a^2*b^6*c^5*d^6*g^3*n/(d*x + c)^4 - 42*(b*x + a)^5*B*a*b^6*
c^6*d^6*g^3*n/(d*x + c)^5 - 2*B*a^7*b^5*d^7*g^3*n - 42*(b*x + a)*B*a^6*b^5*
c*d^7*g^3*n/(d*x + c) + 63*(b*x + a)^2*B*a^5*b^5*c^2*d^7*g^3*n/(d*x + c)^2
+ 1190*(b*x + a)^3*B*a^4*b^5*c^3*d^7*g^3*n/(d*x + c)^3 + 1155*(b*x + a)^4*B
*a^3*b^5*c^4*d^7*g^3*n/(d*x + c)^4 + 126*(b*x + a)^5*B*a^2*b^5*c^5*d^7*g^3*
n/(d*x + c)^5 + 6*(b*x + a)*B*a^7*b^4*d^8*g^3*n/(d*x + c) - 21*(b*x + a)^2*
B*a^6*b^4*c*d^8*g^3*n/(d*x + c)^2 - 714*(b*x + a)^3*B*a^5*b^4*c^2*d^8*g^3*n
/(d*x + c)^3 - 1155*(b*x + a)^4*B*a^4*b^4*c^3*d^8*g^3*n/(d*x + c)^4 - 210*(
b*x + a)^5*B*a^3*b^4*c^4*d^8*g^3*n/(d*x + c)^5 + 3*(b*x + a)^2*B*a^7*b^3*d^
9*g^3*n/(d*x + c)^2 + 238*(b*x + a)^3*B*a^6*b^3*c*d^9*g^3*n/(d*x + c)^3 + 6
93*(b*x + a)^4*B*a^5*b^3*c^2*d^9*g^3*n/(d*x + c)^4 + 210*(b*x + a)^5*B*a^4*
b^3*c^3*d^9*g^3*n/(d*x + c)^5 - 34*(b*x + a)^3*B*a^7*b^2*d^10*g^3*n/(d*x +
c)^3 - 231*(b*x + a)^4*B*a^6*b^2*c*d^10*g^3*n/(d*x + c)^4 - 126*(b*x + a)^5
*B*a^5*b^2*c^2*d^10*g^3*n/(d*x + c)^5 + 33*(b*x + a)^4*B*a^7*b*d^11*g^3*n/(
d*x + c)^4 + 42*(b*x + a)^5*B*a^6*b*c*d^11*g^3*n/(d*x + c)^5 - 6*(b*x + a)^
5*B*a^7*d^12*g^3*n/(d*x + c)^5 + 6*A*b^12*c^7*g^3 + 6*B*b^12*c^7*g^3 - 42*A
*a*b^11*c^6*d*g^3 - 42*B*a*b^11*c^6*d*g^3 - 36*(b*x + a)*A*b^11*c^7*d*g^3/(
d*x + c) - 36*(b*x + a)*B*b^11*c^7*d*g^3/(d*x + c) + 126*A*a^2*b^10*c^5*d^2
*g^3 + 126*B*a^2*b^10*c^5*d^2*g^3 + 252*(b*x + a)*A*a*b^10*c^6*d^2*g^3/(d*x
 + c) + 252*(b*x + a)*B*a*b^10*c^6*d^2*g^3/(d*x + c) + 90*(b*x + a)^2*A*b^1
0*c^7*d^2*g^3/(d*x + c)^2 + 90*(b*x + a)^2*B*b^10*c^7*d^2*g^3/(d*x + c)^2 -
 210*A*a^3*b^9*c^4*d^3*g^3 - 210*B*a^3*b^9*c^4*d^3*g^3 - 756*(b*x + a)*A*a^
2*b^9*c^5*d^3*g^3/(d*x + c) - 756*(b*x + a)*B*a^2*b^9*c^5*d^3*g^3/(d*x + c)
 - 630*(b*x + a)^2*A*a*b^9*c^6*d^3*g^3/(d*x + c)^2 - 630*(b*x + a)^2*B*a*b^
9*c^6*d^3*g^3/(d*x + c)^2 - 120*(b*x + a)^3*A*b^9*c^7*d^3*g^3/(d*x + c)^3 -
 120*(b*x + a)^3*B*b^9*c^7*d^3*g^3/(d*x + c)^3 + 210*A*a^4*b^8*c^3*d^4*g^3
+ 210*B*a^4*b^8*c^3*d^4*g^3 + 1260*(b*x + a)*A*a^3*b^8*c^4*d^4*g^3/(d*x + c
) + 1260*(b*x + a)*B*a^3*b^8*c^4*d^4*g^3/(d*x + c) + 1890*(b*x + a)^2*A*a^2
*b^8*c^5*d^4*g^3/(d*x + c)^2 + 1890*(b*x + a)^2*B*a^2*b^8*c^5*d^4*g^3/(d*x
+ c)^2 + 840*(b*x + a)^3*A*a*b^8*c^6*d^4*g^3/(d...
```

Mupad [B]
time = 5.91, size = 2555, normalized size = 5.78

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)),
x)
```

```
[Out] x^2*((a*c*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n - B*b*c*n))/6 -
(A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (b*g^
3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2*n - 2*B*b^2*c^2*n + 60*A*a
```

```
*b*c*d - B*a*b*c*d*n))/5 + A*a*b^2*c*d*g^3*i^2))/(2*b*d) - ((60*a*d + 60*b*
c)*((g^3*i^2*(16*A*a^3*d^3 + 4*A*b^3*c^3 + 3*B*a^3*d^3*n - B*b^3*c^3*n + 48
*A*a*b^2*c^2*d + 72*A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d*n + 3*B*a^2*b*c*d^2*n))
/(4*d) + ((60*a*d + 60*b*c)*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*
n - B*b*c*n))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c)
)/(60*b*d) - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2*n - 2*B*
b^2*c^2*n + 60*A*a*b*c*d - B*a*b*c*d*n))/5 + A*a*b^2*c*d*g^3*i^2))/(60*b*d)
 - (a*c*((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b
^2*d*g^3*i^2*(60*a*d + 60*b*c))/60))/(b*d)))/(120*b*d) + (a*g^3*i^2*(3*A*a^
3*d^3 + 12*A*b^3*c^3 + B*a^3*d^3*n - 3*B*b^3*c^3*n + 54*A*a*b^2*c^2*d + 36*
A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d*n + 5*B*a^2*b*c*d^2*n))/(6*b*d)) + x^3*((g^
3*i^2*(16*A*a^3*d^3 + 4*A*b^3*c^3 + 3*B*a^3*d^3*n - B*b^3*c^3*n + 48*A*a*b^
2*c^2*d + 72*A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d*n + 3*B*a^2*b*c*d^2*n))/(12*d)
 + ((60*a*d + 60*b*c)*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n - B*
b*c*n))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*
b*d) - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2*n - 2*B*b^2*c^
2*n + 60*A*a*b*c*d - B*a*b*c*d*n))/5 + A*a*b^2*c*d*g^3*i^2))/(180*b*d) - (a
*c*((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b^2*d*
g^3*i^2*(60*a*d + 60*b*c))/60))/(3*b*d)) - x^4*((((b^2*d*g^3*i^2*(24*A*a*d
+ 18*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60
)*(60*a*d + 60*b*c))/(240*b*d) - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 +
3*B*a^2*d^2*n - 2*B*b^2*c^2*n + 60*A*a*b*c*d - B*a*b*c*d*n))/20 + (A*a*b^2*
c*d*g^3*i^2)/4) + x^5*((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n - B*b*
c*n))/30 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/300) - x*(((60*a*d + 60*b*c)
*((a*c*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*
b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (b*g^3*i
^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2*n - 2*B*b^2*c^2*n + 60*A*a*b*
c*d - B*a*b*c*d*n))/5 + A*a*b^2*c*d*g^3*i^2))/(b*d) - ((60*a*d + 60*b*c)*((
g^3*i^2*(16*A*a^3*d^3 + 4*A*b^3*c^3 + 3*B*a^3*d^3*n - B*b^3*c^3*n + 48*A*a*
b^2*c^2*d + 72*A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d*n + 3*B*a^2*b*c*d^2*n))/(4*d
) + ((60*a*d + 60*b*c)*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n - B
*b*c*n))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60
*b*d) - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2*n - 2*B*b^2*c
^2*n + 60*A*a*b*c*d - B*a*b*c*d*n))/5 + A*a*b^2*c*d*g^3*i^2))/(60*b*d) - (a
*c*((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b^2*d*
g^3*i^2*(60*a*d + 60*b*c))/60))/(b*d)))/(60*b*d) + (a*g^3*i^2*(3*A*a^3*d^3
+ 12*A*b^3*c^3 + B*a^3*d^3*n - 3*B*b^3*c^3*n + 54*A*a*b^2*c^2*d + 36*A*a^2*
b*c*d^2 - 3*B*a*b^2*c^2*d*n + 5*B*a^2*b*c*d^2*n))/(3*b*d)))/(60*b*d) + (a*c
*((g^3*i^2*(16*A*a^3*d^3 + 4*A*b^3*c^3 + 3*B*a^3*d^3*n - B*b^3*c^3*n + 48*A
*a*b^2*c^2*d + 72*A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d*n + 3*B*a^2*b*c*d^2*n))/(
4*d) + ((60*a*d + 60*b*c)*((((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n
- B*b*c*n))/6 - (A*b^2*d*g^3*i^2*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/
(60*b*d) - (b*g^3*i^2*(30*A*a^2*d^2 + 15*A*b^2*c^2 + 3*B*a^2*d^2*n - 2*B*b^
2*c^2*n + 60*A*a*b*c*d - B*a*b*c*d*n))/5 + A*a*b^2*c*d*g^3*i^2))/(60*b*d) -
 (a*c*((b^2*d*g^3*i^2*(24*A*a*d + 18*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b^2
```

```
*d*g^3*i^2*(60*a*d + 60*b*c))/60))/(b*d)))/(b*d) - (a^2*c*g^3*i^2*(6*A*a^2*
d^2 + 12*A*b^2*c^2 + 2*B*a^2*d^2*n - 3*B*b^2*c^2*n + 24*A*a*b*c*d + B*a*b*c
*d*n))/(2*b*d)) + log(e*((a + b*x)/(c + d*x))^n)*(B*a^3*c^2*g^3*i^2*x + (B*
a*g^3*i^2*x^3*(a^2*d^2 + 3*b^2*c^2 + 6*a*b*c*d))/3 + (B*b*g^3*i^2*x^4*(3*a^
2*d^2 + b^2*c^2 + 6*a*b*c*d))/4 + (B*b^3*d^2*g^3*i^2*x^6)/6 + (B*a^2*c*g^3*
i^2*x^2*(2*a*d + 3*b*c))/2 + (B*b^2*d*g^3*i^2*x^5*(3*a*d + 2*b*c))/5) + (lo
g(c + d*x)*(B*b^3*c^6*g^3*i^2*n - 20*B*a^3*c^3*d^3*g^3*i^2*n + 15*B*a^2*b*c
^4*d^2*g^3*i^2*n - 6*B*a*b^2*c^5*d*g^3*i^2*n))/(60*d^4) + (log(a + b*x)*(B*
a^6*d^2*g^3*i^2*n + 15*B*a^4*b^2*c^2*g^3*i^2*n - 6*B*a^5*b*c*d*g^3*i^2*n))/
(60*b^3) + (A*b^3*d^2*g^3*i^2*x^6)/6
```

3.118 $\int (ag+bgx)^2(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=352

$$-\frac{B(bc-ad)^4g^2i^2nx}{30b^2d^2}-\frac{B(bc-ad)^3g^2i^2n(c+dx)^2}{60bd^3}+\frac{B(bc-ad)^2g^2i^2n(c+dx)^3}{10d^3}-\frac{bB(bc-ad)g^2i^2n(c+dx)^4}{20d^3}$$

```
[Out] -1/30*B*(-a*d+b*c)^4*g^2*i^2*n*x/b^2/d^2-1/60*B*(-a*d+b*c)^3*g^2*i^2*n*(d*x
+c)^2/b/d^3+1/10*B*(-a*d+b*c)^2*g^2*i^2*n*(d*x+c)^3/d^3-1/20*b*B*(-a*d+b*c)
*g^2*i^2*n*(d*x+c)^4/d^3+1/3*(-a*d+b*c)^2*g^2*i^2*(d*x+c)^3*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))/d^3-1/2*b*(-a*d+b*c)*g^2*i^2*(d*x+c)^4*(A+B*ln(e*((b*x+a)/
(d*x+c))^n))/d^3+1/5*b^2*g^2*i^2*(d*x+c)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/
d^3-1/30*B*(-a*d+b*c)^5*g^2*i^2*n*ln((b*x+a)/(d*x+c))/b^3/d^3-1/30*B*(-a*d+
b*c)^5*g^2*i^2*n*ln(d*x+c)/b^3/d^3
```

Rubi [A]
time = 0.23, antiderivative size = 352, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.116$, Rules used = {2561, 45, 2382, 12, 907}

$$\frac{b^2g^2i^2(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d^3}+\frac{g^2i^2(c+dx)^3(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d^3}-\frac{bg^2i^2(c+dx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d^3}-\frac{Bg^2i^2n(bc-ad)^5\log\left(\frac{a+bx}{c+dx}\right)}{30b^3d^3}-\frac{Bg^2i^2n(bc-ad)^5\log(c+dx)}{30b^3d^3}-\frac{Bg^2i^2nx(bc-ad)^4}{30b^2d^2}-\frac{Bg^2i^2n(c+dx)^2(bc-ad)^3}{60bd^3}+\frac{Bg^2i^2n(c+dx)^3(bc-ad)^2}{10d^3}-\frac{bBg^2i^2n(c+dx)^4(bc-ad)}{20d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),
x]
```

```
[Out] -1/30*(B*(b*c - a*d)^4*g^2*i^2*n*x)/(b^2*d^2) - (B*(b*c - a*d)^3*g^2*i^2*n*
(c + d*x)^2)/(60*b*d^3) + (B*(b*c - a*d)^2*g^2*i^2*n*(c + d*x)^3)/(10*d^3)
- (b*B*(b*c - a*d)*g^2*i^2*n*(c + d*x)^4)/(20*d^3) + ((b*c - a*d)^2*g^2*i^2
*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^3) - (b*(b*c - a*
d)*g^2*i^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^3) + (b
^2*g^2*i^2*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^3) - (B
*(b*c - a*d)^5*g^2*i^2*n*Log[(a + b*x)/(c + d*x)])/(30*b^3*d^3) - (B*(b*c -
 a*d)^5*g^2*i^2*n*Log[c + d*x])/(30*b^3*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (118c+118dx)^2(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx = \int\left(\frac{(-bc+ad)^2g^2(118c+118dx)^2\left(A+\right.}{d^2}\right.$$

$$= \frac{(b^2g^2)\int(118c+118dx)^4\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{13924d^2}$$

$$= \frac{13924(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^3}$$

$$= \frac{13924(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^3}$$

$$= \frac{13924(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^3}$$

$$= -\frac{6962B(bc-ad)^4g^2nx}{15b^2d^2} - \frac{3481B(bc-a}{15}$$

Mathematica [A]

time = 0.19, size = 374, normalized size = 1.06

$$\frac{g^2i^2\left(20d^3(bc-ad)^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+30d^4(bc-ad)(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+12d^5(a+bx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+10B(bc-ad)^3n(2bd(bc-ad)x-d^2(a+bx)^2-2(bc-ad)^2\log(c+dx))-5B(bc-ad)^2n(6bd(bc-ad)^2x+3d^2(-bc+ad)(a+bx)^2+2d^3(a+bx)^3-6(bc-ad)^3\log(c+dx))+B(bc-ad)n(12bd(bc-ad)^3x-6d^2(bc-ad)^2(a+bx)^2+4d^3(bc-ad)(a+bx)^3-3d^4(a+bx)^4-12(bc-ad)^4\log(c+dx))\right)}{60b^3d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]),x]
```

```
[Out] (g^2*i^2*(20*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) + 30*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]) + 12*d^5*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 10*B*(b*c
 - a*d)^3*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c
+ d*x]) - 5*B*(b*c - a*d)^2*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)
*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + B*(b*c -
 a*d)*n*(12*b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(
b*c - a*d)*(a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x])
))/(60*b^3*d^3)
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int (bgx+ag)^2 (dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1269 vs. $2(310) = 620$.
time = 0.30, size = 1269, normalized size = 3.61

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="maxima")
```

```
[Out] -1/5*B*b^2*d^2*g^2*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/5*A*b^2*d
^2*g^2*x^5 - 1/2*B*b^2*c*d*g^2*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) -
 1/2*B*a*b*d^2*g^2*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/2*A*b^2*c
*d*g^2*x^4 - 1/2*A*a*b*d^2*g^2*x^4 - 1/3*B*b^2*c^2*g^2*x^3*log((b*x/(d*x +
c) + a/(d*x + c))^n*e) - 4/3*B*a*b*c*d*g^2*x^3*log((b*x/(d*x + c) + a/(d*x
+ c))^n*e) - 1/3*B*a^2*d^2*g^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) -
```

```
1/3*A*b^2*c^2*g^2*x^3 - 4/3*A*a*b*c*d*g^2*x^3 - 1/3*A*a^2*d^2*g^2*x^3 - B*
a*b*c^2*g^2*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - B*a^2*c*d*g^2*x^2*
log((b*x/(d*x + c) + a/(d*x + c))^n*e) - A*a*b*c^2*g^2*x^2 - A*a^2*c*d*g^2*
x^2 - 1/60*B*b^2*d^2*g^2*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d
^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6
*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) + 1/12*
B*b^2*c*d*g^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*
c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d
^3)*x)/(b^3*d^3)) + 1/12*B*a*b*d^2*g^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*lo
g(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/6*B*b^2*c^2*g^2*n*(2*a^3*log
(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*
c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2/3*B*a*b*c*d*g^2*n*(2*a^3*log(b*x + a)/b^3
- 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)
*x)/(b^2*d^2)) - 1/6*B*a^2*d^2*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*
x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))
 + B*a*b*c^2*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*
d)*x/(b*d)) + B*a^2*c*d*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
+ (b*c - a*d)*x/(b*d)) - B*a^2*c^2*g^2*n*(a*log(b*x + a)/b - c*log(d*x + c)
/d) - B*a^2*c^2*g^2*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - A*a^2*c^2*g^
2*x
```

Fricas [A]
time = 0.42, size = 596, normalized size = 1.69

$$-\frac{12\,(A+B)b^5d^5g^2x^5-3\,((Bb^5cd^4-Bab^4d^5)g^2n-10\,((A+B)b^5cd^4+(A+B)ab^4d^5)g^2)x^4+2\,(10\,Ba^3b^2c^2d^3-5\,Ba^4bcd^4+Ba^5d^5)g^2n\log\left(\frac{bx+a}{b}\right)-2\,(Bb^5c^5-5\,Bab^4c^4d+10\,Ba^2b^3c^3d^2)g^2n\log\left(\frac{dx+c}{d}\right)-2\,(3\,(Bb^5c^2d^3-Ba^2b^3d^5)g^2n-10\,((A+B)b^5c^2d^3+4\,(A+B)ab^4cd^4+(A+B)a^2b^3d^5)g^2)x^3-((Bb^5c^3d^2+15\,Bab^4c^2d^3-15\,Ba^2b^3cd^4-Ba^3b^2d^5)g^2n-60\,((A+B)ab^4c^2d^3+(A+B)a^2b^3cd^4)g^2)x^2+2\,(30\,(A+B)a^2b^3c^2d^3g^2+(Bb^5c^4d-5\,Bab^4c^3d^2+5\,Ba^3b^2cd^4-Ba^4bd^5)g^2n)x+2\,(6\,Bb^5d^5g^2nx^5+30\,Ba^2b^3c^2d^3g^2nx+15\,(Bb^5cd^4+Bab^4d^5)g^2nx^4+10\,(Bb^5c^2d^3+4\,Bab^4cd^4+Ba^2b^3d^5)g^2nx^3+30\,(Bab^4c^2d^3+Ba^2b^3cd^4)g^2nx^2)\log\left(\frac{bx+a}{dx+c}\right)}{60\,b^3d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="fricas")
```

```
[Out] -1/60*(12*(A + B)*b^5*d^5*g^2*x^5 - 3*((B*b^5*c*d^4 - B*a*b^4*d^5)*g^2*n -
10*((A + B)*b^5*c*d^4 + (A + B)*a*b^4*d^5)*g^2)*x^4 + 2*(10*B*a^3*b^2*c^2*d
^3 - 5*B*a^4*b*c*d^4 + B*a^5*d^5)*g^2*n*log((b*x + a)/b) - 2*(B*b^5*c^5 - 5
*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2)*g^2*n*log((d*x + c)/d) - 2*(3*(B*b^5
*c^2*d^3 - B*a^2*b^3*d^5)*g^2*n - 10*((A + B)*b^5*c^2*d^3 + 4*(A + B)*a*b^4
*c*d^4 + (A + B)*a^2*b^3*d^5)*g^2)*x^3 - ((B*b^5*c^3*d^2 + 15*B*a*b^4*c^2*d
^3 - 15*B*a^2*b^3*c*d^4 - B*a^3*b^2*d^5)*g^2*n - 60*((A + B)*a*b^4*c^2*d^3
+ (A + B)*a^2*b^3*c*d^4)*g^2)*x^2 + 2*(30*(A + B)*a^2*b^3*c^2*d^3*g^2 + (B*
b^5*c^4*d - 5*B*a*b^4*c^3*d^2 + 5*B*a^3*b^2*c*d^4 - B*a^4*b*d^5)*g^2*n)*x +
 2*(6*B*b^5*d^5*g^2*n*x^5 + 30*B*a^2*b^3*c^2*d^3*g^2*n*x + 15*(B*b^5*c*d^4
+ B*a*b^4*d^5)*g^2*n*x^4 + 10*(B*b^5*c^2*d^3 + 4*B*a*b^4*c*d^4 + B*a^2*b^3*
d^5)*g^2*n*x^3 + 30*(B*a*b^4*c^2*d^3 + B*a^2*b^3*c*d^4)*g^2*n*x^2)*log((b*x
 + a)/(d*x + c)))/(b^3*d^3)
```

Sympy [F(-1)] Timed out

time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 2995 vs. $2(310) = 620$.
time = 4.33, size = 2995, normalized size = 8.51

Too large to display

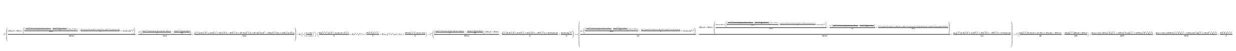
Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="giac")
```

```
[Out] -1/60*(2*(B*b^8*c^6*g^2*n - 6*B*a*b^7*c^5*d*g^2*n - 5*(b*x + a)*B*b^7*c^6*d
*g^2*n/(d*x + c) + 15*B*a^2*b^6*c^4*d^2*g^2*n + 30*(b*x + a)*B*a*b^6*c^5*d^
2*g^2*n/(d*x + c) + 10*(b*x + a)^2*B*b^6*c^6*d^2*g^2*n/(d*x + c)^2 - 20*B*a
^3*b^5*c^3*d^3*g^2*n - 75*(b*x + a)*B*a^2*b^5*c^4*d^3*g^2*n/(d*x + c) - 60*
(b*x + a)^2*B*a*b^5*c^5*d^3*g^2*n/(d*x + c)^2 + 15*B*a^4*b^4*c^2*d^4*g^2*n
+ 100*(b*x + a)*B*a^3*b^4*c^3*d^4*g^2*n/(d*x + c) + 150*(b*x + a)^2*B*a^2*b
^4*c^4*d^4*g^2*n/(d*x + c)^2 - 6*B*a^5*b^3*c*d^5*g^2*n - 75*(b*x + a)*B*a^4
*b^3*c^2*d^5*g^2*n/(d*x + c) - 200*(b*x + a)^2*B*a^3*b^3*c^3*d^5*g^2*n/(d*x
 + c)^2 + B*a^6*b^2*d^6*g^2*n + 30*(b*x + a)*B*a^5*b^2*c*d^6*g^2*n/(d*x + c
) + 150*(b*x + a)^2*B*a^4*b^2*c^2*d^6*g^2*n/(d*x + c)^2 - 5*(b*x + a)*B*a^6
*b*d^7*g^2*n/(d*x + c) - 60*(b*x + a)^2*B*a^5*b*c*d^7*g^2*n/(d*x + c)^2 + 1
0*(b*x + a)^2*B*a^6*d^8*g^2*n/(d*x + c)^2)*log((b*x + a)/(d*x + c))/(b^5*d^
3 - 5*(b*x + a)*b^4*d^4/(d*x + c) + 10*(b*x + a)^2*b^3*d^5/(d*x + c)^2 - 10
*(b*x + a)^3*b^2*d^6/(d*x + c)^3 + 5*(b*x + a)^4*b*d^7/(d*x + c)^4 - (b*x +
 a)^5*d^8/(d*x + c)^5) + (2*(b*x + a)*B*b^9*c^6*d*g^2*n/(d*x + c) - 12*(b*x
 + a)*B*a*b^8*c^5*d^2*g^2*n/(d*x + c) - 9*(b*x + a)^2*B*b^8*c^6*d^2*g^2*n/(
d*x + c)^2 + 30*(b*x + a)*B*a^2*b^7*c^4*d^3*g^2*n/(d*x + c) + 54*(b*x + a)^
2*B*a*b^7*c^5*d^3*g^2*n/(d*x + c)^2 + 9*(b*x + a)^3*B*b^7*c^6*d^3*g^2*n/(d*
x + c)^3 - 40*(b*x + a)*B*a^3*b^6*c^3*d^4*g^2*n/(d*x + c) - 135*(b*x + a)^2
*B*a^2*b^6*c^4*d^4*g^2*n/(d*x + c)^2 - 54*(b*x + a)^3*B*a*b^6*c^5*d^4*g^2*n
/(d*x + c)^3 - 2*(b*x + a)^4*B*b^6*c^6*d^4*g^2*n/(d*x + c)^4 + 30*(b*x + a)
*B*a^4*b^5*c^2*d^5*g^2*n/(d*x + c) + 180*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g^2*
n/(d*x + c)^2 + 135*(b*x + a)^3*B*a^2*b^5*c^4*d^5*g^2*n/(d*x + c)^3 + 12*(b
*x + a)^4*B*a*b^5*c^5*d^5*g^2*n/(d*x + c)^4 - 12*(b*x + a)*B*a^5*b^4*c*d^6*
g^2*n/(d*x + c) - 135*(b*x + a)^2*B*a^4*b^4*c^2*d^6*g^2*n/(d*x + c)^2 - 180
*(b*x + a)^3*B*a^3*b^4*c^3*d^6*g^2*n/(d*x + c)^3 - 30*(b*x + a)^4*B*a^2*b^4
```

```
*c^4*d^6*g^2*n/(d*x + c)^4 + 2*(b*x + a)*B*a^6*b^3*d^7*g^2*n/(d*x + c) + 54
*(b*x + a)^2*B*a^5*b^3*c*d^7*g^2*n/(d*x + c)^2 + 135*(b*x + a)^3*B*a^4*b^3*
c^2*d^7*g^2*n/(d*x + c)^3 + 40*(b*x + a)^4*B*a^3*b^3*c^3*d^7*g^2*n/(d*x + c
)^4 - 9*(b*x + a)^2*B*a^6*b^2*d^8*g^2*n/(d*x + c)^2 - 54*(b*x + a)^3*B*a^5*
b^2*c*d^8*g^2*n/(d*x + c)^3 - 30*(b*x + a)^4*B*a^4*b^2*c^2*d^8*g^2*n/(d*x +
 c)^4 + 9*(b*x + a)^3*B*a^6*b*d^9*g^2*n/(d*x + c)^3 + 12*(b*x + a)^4*B*a^5*
b*c*d^9*g^2*n/(d*x + c)^4 - 2*(b*x + a)^4*B*a^6*d^10*g^2*n/(d*x + c)^4 + 2*
A*b^10*c^6*g^2 + 2*B*b^10*c^6*g^2 - 12*A*a*b^9*c^5*d*g^2 - 12*B*a*b^9*c^5*d
*g^2 - 10*(b*x + a)*A*b^9*c^6*d*g^2/(d*x + c) - 10*(b*x + a)*B*b^9*c^6*d*g^
2/(d*x + c) + 30*A*a^2*b^8*c^4*d^2*g^2 + 30*B*a^2*b^8*c^4*d^2*g^2 + 60*(b*x
 + a)*A*a*b^8*c^5*d^2*g^2/(d*x + c) + 60*(b*x + a)*B*a*b^8*c^5*d^2*g^2/(d*x
 + c) + 20*(b*x + a)^2*A*b^8*c^6*d^2*g^2/(d*x + c)^2 + 20*(b*x + a)^2*B*b^8
*c^6*d^2*g^2/(d*x + c)^2 - 40*A*a^3*b^7*c^3*d^3*g^2 - 40*B*a^3*b^7*c^3*d^3*
g^2 - 150*(b*x + a)*A*a^2*b^7*c^4*d^3*g^2/(d*x + c) - 150*(b*x + a)*B*a^2*b
^7*c^4*d^3*g^2/(d*x + c) - 120*(b*x + a)^2*A*a*b^7*c^5*d^3*g^2/(d*x + c)^2
- 120*(b*x + a)^2*B*a*b^7*c^5*d^3*g^2/(d*x + c)^2 + 30*A*a^4*b^6*c^2*d^4*g^
2 + 30*B*a^4*b^6*c^2*d^4*g^2 + 200*(b*x + a)*A*a^3*b^6*c^3*d^4*g^2/(d*x + c
) + 200*(b*x + a)*B*a^3*b^6*c^3*d^4*g^2/(d*x + c) + 300*(b*x + a)^2*A*a^2*b
^6*c^4*d^4*g^2/(d*x + c)^2 + 300*(b*x + a)^2*B*a^2*b^6*c^4*d^4*g^2/(d*x + c
)^2 - 12*A*a^5*b^5*c*d^5*g^2 - 12*B*a^5*b^5*c*d^5*g^2 - 150*(b*x + a)*A*a^4
*b^5*c^2*d^5*g^2/(d*x + c) - 150*(b*x + a)*B*a^4*b^5*c^2*d^5*g^2/(d*x + c)
- 400*(b*x + a)^2*A*a^3*b^5*c^3*d^5*g^2/(d*x + c)^2 - 400*(b*x + a)^2*B*a^3
*b^5*c^3*d^5*g^2/(d*x + c)^2 + 2*A*a^6*b^4*d^6*g^2 + 2*B*a^6*b^4*d^6*g^2 +
60*(b*x + a)*A*a^5*b^4*c*d^6*g^2/(d*x + c) + 60*(b*x + a)*B*a^5*b^4*c*d^6*g
^2/(d*x + c) + 300*(b*x + a)^2*A*a^4*b^4*c^2*d^6*g^2/(d*x + c)^2 + 300*(b*x
 + a)^2*B*a^4*b^4*c^2*d^6*g^2/(d*x + c)^2 - 10*(b*x + a)*A*a^6*b^3*d^7*g^2/
(d*x + c) - 10*(b*x + a)*B*a^6*b^3*d^7*g^2/(d*x + c) - 120*(b*x + a)^2*A*a^
5*b^3*c*d^7*g^2/(d*x + c)^2 - 120*(b*x + a)^2*B*a^5*b^3*c*d^7*g^2/(d*x + c)
^2 + 20*(b*x + a)^2*A*a^6*b^2*d^8*g^2/(d*x + c)^2 + 20*(b*x + a)^2*B*a^6*b^
2*d^8*g^2/(d*x + c)^2)/(b^7*d^3 - 5*(b*x + a)*b^6*d^4/(d*x + c) + 10*(b*x +
 a)^2*b^5*d^5/(d*x + c)^2 - 10*(b*x + a)^3*b^4*d^6/(d*x + c)^3 + 5*(b*x + a
)^4*b^3*d^7/(d*x + c)^4 - (b*x + a)^5*b^2*d^8/(d*x + c)^5) + 2*(B*b^6*c^6*g
^2*n - 6*B*a*b^5*c^5*d*g^2*n + 15*B*a^2*b^4*c^4*d^2*g^2*n - 20*B*a^3*b^3*c^
3*d^3*g^2*n + 15*B*a^4*b^2*c^2*d^4*g^2*n - 6*B*a^5*b*c*d^5*g^2*n + B*a^6*d^
6*g^2*n)*log(b - (b*x + a)*d/(d*x + c))/(b^3*d^3) - 2*(B*b^6*c^6*g^2*n - 6*
B*a*b^5*c^5*d*g^2*n + 15*B*a^2*b^4*c^4*d^2*g^2*n - 20*B*a^3*b^3*c^3*d^3*g^2
*n + 15*B*a^4*b^2*c^2*d^4*g^2*n - 6*B*a^5*b*c*d^5*g^2*n + B*a^6*d^6*g^2*n)*
log((b*x + a)/(d*x + c))/(b^3*d^3))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 5.14, size = 1328, normalized size = 3.77



Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)),
x)
```

```
[Out] x^2*(((30*a*d + 30*b*c)*((((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d*n - B*
b*c*n))/5 - (A*b*d*g^2*i^2*(30*a*d + 30*b*c))/30)*(30*a*d + 30*b*c))/(30*b*
d) - (g^2*i^2*(6*A*a^2*d^2 + 6*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 18*A
*a*b*c*d))/2 + A*a*b*c*d*g^2*i^2))/(60*b*d) - (a*c*((b*d*g^2*i^2*(15*A*a*d
+ 15*A*b*c + B*a*d*n - B*b*c*n))/5 - (A*b*d*g^2*i^2*(30*a*d + 30*b*c))/30))
/(2*b*d) + (g^2*i^2*(3*A*a^3*d^3 + 3*A*b^3*c^3 + B*a^3*d^3*n - B*b^3*c^3*n
+ 27*A*a*b^2*c^2*d + 27*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d*n + 3*B*a^2*b*c*d^2
*n))/(6*b*d)) + log(e*((a + b*x)/(c + d*x))^n)*((B*g^2*i^2*x^3*(a^2*d^2 + b
^2*c^2 + 4*a*b*c*d))/3 + B*a^2*c^2*g^2*i^2*x + (B*b^2*d^2*g^2*i^2*x^5)/5 +
B*a*c*g^2*i^2*x^2*(a*d + b*c) + (B*b*d*g^2*i^2*x^4*(a*d + b*c))/2) - x^3*((
((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d*n - B*b*c*n))/5 - (A*b*d*g^2*i^2
*(30*a*d + 30*b*c))/30)*(30*a*d + 30*b*c))/(90*b*d) - (g^2*i^2*(6*A*a^2*d^2
 + 6*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 18*A*a*b*c*d))/6 + (A*a*b*c*d*
g^2*i^2)/3) + x*((a*c*((((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d*n - B*b*
c*n))/5 - (A*b*d*g^2*i^2*(30*a*d + 30*b*c))/30)*(30*a*d + 30*b*c))/(30*b*d)
 - (g^2*i^2*(6*A*a^2*d^2 + 6*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 18*A*a
*b*c*d))/2 + A*a*b*c*d*g^2*i^2))/(b*d) - ((30*a*d + 30*b*c)*(((30*a*d + 30*
b*c)*((((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d*n - B*b*c*n))/5 - (A*b*d*
g^2*i^2*(30*a*d + 30*b*c))/30)*(30*a*d + 30*b*c))/(30*b*d) - (g^2*i^2*(6*A*
a^2*d^2 + 6*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 18*A*a*b*c*d))/2 + A*a*
b*c*d*g^2*i^2))/(30*b*d) - (a*c*((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d*
n - B*b*c*n))/5 - (A*b*d*g^2*i^2*(30*a*d + 30*b*c))/30))/(b*d) + (g^2*i^2*(
3*A*a^3*d^3 + 3*A*b^3*c^3 + B*a^3*d^3*n - B*b^3*c^3*n + 27*A*a*b^2*c^2*d +
27*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d*n + 3*B*a^2*b*c*d^2*n))/(3*b*d)))/(30*b*
d) + (a*c*g^2*i^2*(3*A*a^2*d^2 + 3*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n +
9*A*a*b*c*d))/(b*d)) + x^4*((b*d*g^2*i^2*(15*A*a*d + 15*A*b*c + B*a*d*n - B
*b*c*n))/20 - (A*b*d*g^2*i^2*(30*a*d + 30*b*c))/120) + (log(a + b*x)*(B*a^5
*d^2*g^2*i^2*n + 10*B*a^3*b^2*c^2*g^2*i^2*n - 5*B*a^4*b*c*d*g^2*i^2*n))/(30
*b^3) - (log(c + d*x)*(B*b^2*c^5*g^2*i^2*n + 10*B*a^2*c^3*d^2*g^2*i^2*n - 5
*B*a*b*c^4*d*g^2*i^2*n))/(30*d^3) + (A*b^2*d^2*g^2*i^2*x^5)/5
```

3.119 $\int (ag+bgx)(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=250

$$\frac{B(bc-ad)^3gi^2nx}{12b^2d}+\frac{B(bc-ad)^2gi^2n(c+dx)^2}{24bd^2}-\frac{B(bc-ad)gi^2n(c+dx)^3}{12d^2}-\frac{(bc-ad)gi^2(c+dx)^3\left(A+B\log\right.}{3d^2}$$

```
[Out] 1/12*B*(-a*d+b*c)^3*g*i^2*n*x/b^2/d+1/24*B*(-a*d+b*c)^2*g*i^2*n*(d*x+c)^2/b
/d^2-1/12*B*(-a*d+b*c)*g*i^2*n*(d*x+c)^3/d^2-1/3*(-a*d+b*c)*g*i^2*(d*x+c)^3
*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^2+1/4*b*g*i^2*(d*x+c)^4*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))/d^2+1/12*B*(-a*d+b*c)^4*g*i^2*n*ln((b*x+a)/(d*x+c))/b^3/d^2
+1/12*B*(-a*d+b*c)^4*g*i^2*n*ln(d*x+c)/b^3/d^2
```

Rubi [A]
time = 0.15, antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.122$, Rules used = {2561, 45, 2382, 12, 78}

$$-\frac{gi^2(c+dx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d^2}+\frac{bgi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^2}+\frac{Bgi^2n(bc-ad)^4\log\left(\frac{a+bx}{c+dx}\right)}{12b^3d^2}+\frac{Bgi^2n(bc-ad)^4\log(c+dx)}{12b^3d^2}+\frac{Bgi^2nx(bc-ad)^3}{12b^2d}+\frac{Bgi^2n(c+dx)^2(bc-ad)^2}{24bd^2}-\frac{Bgi^2n(c+dx)^3(bc-ad)}{12d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (B*(b*c - a*d)^3*g*i^2*n*x)/(12*b^2*d) + (B*(b*c - a*d)^2*g*i^2*n*(c + d*x)
^2)/(24*b*d^2) - (B*(b*c - a*d)*g*i^2*n*(c + d*x)^3)/(12*d^2) - ((b*c - a*d
)*g*i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^2) + (b*g*
i^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^2) + (B*(b*c -
 a*d)^4*g*i^2*n*Log[(a + b*x)/(c + d*x)])/(12*b^3*d^2) + (B*(b*c - a*d)^4*g
*i^2*n*Log[c + d*x])/(12*b^3*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
```

```
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (119c+119dx)^2(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx = \int \left(\frac{(-bc+ad)g(119c+119dx)^2\left(A+\right.}{d}\right.$$

$$= \frac{(bg)\int (119c+119dx)^3\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{119d}$$

$$= -\frac{14161(bc-ad)g(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^2}$$

$$= -\frac{14161(bc-ad)g(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^2}$$

$$= -\frac{14161(bc-ad)g(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^2}$$

$$= \frac{14161B(bc-ad)^3gnx}{12b^2d} + \frac{14161B(bc-a}{24b}$$

Mathematica [A]

time = 0.14, size = 224, normalized size = 0.90

$$\frac{gi^2\left(\frac{4B(bc-ad)^2n(2bd(bc-ad)x+b^2(c+dx)^2+2(bc-ad)^2\log(a+bx))}{b^3}-\frac{B(bc-ad)n(6bd(bc-ad)^2x+3b^2(bc-ad)(c+dx)^2+2b^3(c+dx)^3+6(bc-ad)^3\log(a+bx))}{b^3}-8(bc-ad)(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+6b(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\right)}{24d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]),x]
```

```
[Out] (g*i^2*((4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*
c - a*d)^2*Log[a + b*x]))/b^3 - (B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3
*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a +
b*x]))/b^3 - 8*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]) + 6*b*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(24*d^2)
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int (bgx + ag)(dix + ci)^2 \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 696 vs. $2(217) = 434$.
time = 0.29, size = 696, normalized size = 2.78

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="maxima")
```

```
[Out] -1/4*B*b*d^2*g*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*A*b*d^2*g*x
^4 - 2/3*B*b*c*d*g*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/3*B*a*d^2
*g*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2/3*A*b*c*d*g*x^3 - 1/3*A*a
*d^2*g*x^3 - 1/2*B*b*c^2*g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - B*a
*c*d*g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/2*A*b*c^2*g*x^2 - A*a
*c*d*g*x^2 + 1/24*B*b*d^2*g*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/
d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b
^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/3*B*b*c*d*g*n*(2*a^3*log(b*x + a)/b^3 -
 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*
x)/(b^2*d^2)) - 1/6*B*a*d^2*g*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/
2*B*b*c^2*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/
(b*d)) + B*a*c*d*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c -
a*d)*x/(b*d)) - B*a*c^2*g*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) - B*a*c^2
*g*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - A*a*c^2*g*x
```

Fricas [A]
time = 0.46, size = 411, normalized size = 1.64

$$-\frac{6(A+B)b^4d^4gx^4 - 2\left((Bb^4cd^3 - Bab^3d^4)gn - 4(2(A+B)b^4cd^3 + (A+B)ab^3d^4)g\right)x^3 + 2(6Ba^2b^2c^2d^2 - 4Ba^3bcd^3 + Ba^4d^4)gn\log\left(\frac{bx+a}{b}\right) + 2(Bb^4c^4 - 4Bab^3c^3d)gn\log\left(\frac{dx+c}{d}\right) - \left((5Bb^4c^2d^2 - 4Bab^3cd^3 - Ba^2b^2d^4)gn - 12((A+B)b^4c^2d^2 + 2(A+B)ab^3cd^3)g\right)x^2 + 2\left(12(A+B)ab^3c^2d^2g - (Bb^4c^3d + 2Bab^3c^2d^2 - 4Ba^2b^2cd^3 + Ba^3bd^4)gn\right)x + 2\left(3Bb^4d^4gnx^4 + 12Bab^3c^2d^2gnx + 4(2Bb^4cd^3 + Bab^3d^4)gnx^3 + 6(Bb^4c^2d^2 + 2Bab^3cd^3)gnx^2\right)\log\left(\frac{bx+a}{dx+c}\right)}{24b^3d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="fricas")
```

```
[Out] -1/24*(6*(A + B)*b^4*d^4*g*x^4 - 2*((B*b^4*c*d^3 - B*a*b^3*d^4)*g*n - 4*(2*
(A + B)*b^4*c*d^3 + (A + B)*a*b^3*d^4)*g)*x^3 + 2*(6*B*a^2*b^2*c^2*d^2 - 4*
B*a^3*b*c*d^3 + B*a^4*d^4)*g*n*log((b*x + a)/b) + 2*(B*b^4*c^4 - 4*B*a*b^3*
c^3*d)*g*n*log((d*x + c)/d) - ((5*B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 - B*a^2*b
^2*d^4)*g*n - 12*((A + B)*b^4*c^2*d^2 + 2*(A + B)*a*b^3*c*d^3)*g)*x^2 + 2*(
12*(A + B)*a*b^3*c^2*d^2*g - (B*b^4*c^3*d + 2*B*a*b^3*c^2*d^2 - 4*B*a^2*b^2
*c*d^3 + B*a^3*b*d^4)*g*n)*x + 2*(3*B*b^4*d^4*g*n*x^4 + 12*B*a*b^3*c^2*d^2*
g*n*x + 4*(2*B*b^4*c*d^3 + B*a*b^3*d^4)*g*n*x^3 + 6*(B*b^4*c^2*d^2 + 2*B*a*
b^3*c*d^3)*g*n*x^2)*log((b*x + a)/(d*x + c)))/(b^3*d^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 1757 vs. $2(217) = 434$.
time = 4.44, size = 1757, normalized size = 7.03

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="giac")
```

```
[Out] 1/24*(2*(B*b^6*c^5*g*n - 5*B*a*b^5*c^4*d*g*n - 4*(b*x + a)*B*b^5*c^5*d*g*n/
(d*x + c) + 10*B*a^2*b^4*c^3*d^2*g*n + 20*(b*x + a)*B*a*b^4*c^4*d^2*g*n/(d*
x + c) - 10*B*a^3*b^3*c^2*d^3*g*n - 40*(b*x + a)*B*a^2*b^3*c^3*d^3*g*n/(d*x
 + c) + 5*B*a^4*b^2*c*d^4*g*n + 40*(b*x + a)*B*a^3*b^2*c^2*d^4*g*n/(d*x + c
) - B*a^5*b*d^5*g*n - 20*(b*x + a)*B*a^4*b*c*d^5*g*n/(d*x + c) + 4*(b*x + a
)*B*a^5*d^6*g*n/(d*x + c))*log((b*x + a)/(d*x + c))/(b^4*d^2 - 4*(b*x + a)*
```

```
b^3*d^3/(d*x + c) + 6*(b*x + a)^2*b^2*d^4/(d*x + c)^2 - 4*(b*x + a)^3*b*d^5
/(d*x + c)^3 + (b*x + a)^4*d^6/(d*x + c)^4) - (B*b^8*c^5*g*n - 5*B*a*b^7*c^
4*d*g*n - 6*(b*x + a)*B*b^7*c^5*d*g*n/(d*x + c) + 10*B*a^2*b^6*c^3*d^2*g*n
+ 30*(b*x + a)*B*a*b^6*c^4*d^2*g*n/(d*x + c) + 7*(b*x + a)^2*B*b^6*c^5*d^2*
g*n/(d*x + c)^2 - 10*B*a^3*b^5*c^2*d^3*g*n - 60*(b*x + a)*B*a^2*b^5*c^3*d^3
*g*n/(d*x + c) - 35*(b*x + a)^2*B*a*b^5*c^4*d^3*g*n/(d*x + c)^2 - 2*(b*x +
a)^3*B*b^5*c^5*d^3*g*n/(d*x + c)^3 + 5*B*a^4*b^4*c*d^4*g*n + 60*(b*x + a)*B
*a^3*b^4*c^2*d^4*g*n/(d*x + c) + 70*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g*n/(d*x
+ c)^2 + 10*(b*x + a)^3*B*a*b^4*c^4*d^4*g*n/(d*x + c)^3 - B*a^5*b^3*d^5*g*n
 - 30*(b*x + a)*B*a^4*b^3*c*d^5*g*n/(d*x + c) - 70*(b*x + a)^2*B*a^3*b^3*c^
2*d^5*g*n/(d*x + c)^2 - 20*(b*x + a)^3*B*a^2*b^3*c^3*d^5*g*n/(d*x + c)^3 +
6*(b*x + a)*B*a^5*b^2*d^6*g*n/(d*x + c) + 35*(b*x + a)^2*B*a^4*b^2*c*d^6*g*
n/(d*x + c)^2 + 20*(b*x + a)^3*B*a^3*b^2*c^2*d^6*g*n/(d*x + c)^3 - 7*(b*x +
 a)^2*B*a^5*b*d^7*g*n/(d*x + c)^2 - 10*(b*x + a)^3*B*a^4*b*c*d^7*g*n/(d*x +
 c)^3 + 2*(b*x + a)^3*B*a^5*d^8*g*n/(d*x + c)^3 - 2*A*b^8*c^5*g - 2*B*b^8*c
^5*g + 10*A*a*b^7*c^4*d*g + 10*B*a*b^7*c^4*d*g + 8*(b*x + a)*A*b^7*c^5*d*g/
(d*x + c) + 8*(b*x + a)*B*b^7*c^5*d*g/(d*x + c) - 20*A*a^2*b^6*c^3*d^2*g -
20*B*a^2*b^6*c^3*d^2*g - 40*(b*x + a)*A*a*b^6*c^4*d^2*g/(d*x + c) - 40*(b*x
 + a)*B*a*b^6*c^4*d^2*g/(d*x + c) + 20*A*a^3*b^5*c^2*d^3*g + 20*B*a^3*b^5*c
^2*d^3*g + 80*(b*x + a)*A*a^2*b^5*c^3*d^3*g/(d*x + c) + 80*(b*x + a)*B*a^2*
b^5*c^3*d^3*g/(d*x + c) - 10*A*a^4*b^4*c*d^4*g - 10*B*a^4*b^4*c*d^4*g - 80*
(b*x + a)*A*a^3*b^4*c^2*d^4*g/(d*x + c) - 80*(b*x + a)*B*a^3*b^4*c^2*d^4*g/
(d*x + c) + 2*A*a^5*b^3*d^5*g + 2*B*a^5*b^3*d^5*g + 40*(b*x + a)*A*a^4*b^3*
c*d^5*g/(d*x + c) + 40*(b*x + a)*B*a^4*b^3*c*d^5*g/(d*x + c) - 8*(b*x + a)*
A*a^5*b^2*d^6*g/(d*x + c) - 8*(b*x + a)*B*a^5*b^2*d^6*g/(d*x + c))/(b^6*d^2
 - 4*(b*x + a)*b^5*d^3/(d*x + c) + 6*(b*x + a)^2*b^4*d^4/(d*x + c)^2 - 4*(b
*x + a)^3*b^3*d^5/(d*x + c)^3 + (b*x + a)^4*b^2*d^6/(d*x + c)^4) + 2*(B*b^5
*c^5*g*n - 5*B*a*b^4*c^4*d*g*n + 10*B*a^2*b^3*c^3*d^2*g*n - 10*B*a^3*b^2*c^
2*d^3*g*n + 5*B*a^4*b*c*d^4*g*n - B*a^5*d^5*g*n)*log(-b + (b*x + a)*d/(d*x
+ c))/(b^3*d^2) - 2*(B*b^5*c^5*g*n - 5*B*a*b^4*c^4*d*g*n + 10*B*a^2*b^3*c^3
*d^2*g*n - 10*B*a^3*b^2*c^2*d^3*g*n + 5*B*a^4*b*c*d^4*g*n - B*a^5*d^5*g*n)*
log((b*x + a)/(d*x + c))/(b^3*d^2))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]

time = 5.15, size = 661, normalized size = 2.64

$$\ln\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\left(Bac^2gi^2x+\frac{Bcgi^2x^2(2ad+bc)}{2}+\frac{Bdgi^2x^3(ad+2bc)}{3}+\frac{Bbd^2gi^2x^4}{4}\right)+x^3\left(\frac{dgi^2(8Aad+12Abc+Badn-Bbcn)}{12}-\frac{Adgi^2(12ad+12bc)}{36}\right)+x\left(\frac{(12ad+12bc)\left(\frac{\left(\frac{dgi^2(8Aad+12Abc+Badn-Bbcn)}{4}-\frac{Adgi^2(12ad+12bc)}{12}\right)(12ad+12bc)}{12bd}-\frac{gi^2(3Aa^2d^2+9Ab^2c^2+Ba^2d^2n-2Bb^2c^2n+18Aabcd+Babcdn)}{3b}+Aacdgi^2\right)}{12bd}-\frac{ac\left(\frac{dgi^2(8Aad+12Abc+Badn-Bbcn)}{4}-\frac{Adgi^2(12ad+12bc)}{12}\right)}{bd}+\frac{cgi^2(6Aa^2d^2+2Ab^2c^2+2Ba^2d^2n-Bb^2c^2n+12Aabcd-Babcdn)}{2bd}\right)-x^2\left(\frac{\left(\frac{dgi^2(8Aad+12Abc+Badn-Bbcn)}{4}-\frac{Adgi^2(12ad+12bc)}{12}\right)(12ad+12bc)}{24bd}-\frac{gi^2(3Aa^2d^2+9Ab^2c^2+Ba^2d^2n-2Bb^2c^2n+18Aabcd+Babcdn)}{6b}+\frac{Aacdgi^2}{2}\right)+\frac{\ln(c+dx)(Bbc^4gi^2n-4Bac^3dgi^2n)}{12d^2}+\frac{\ln(a+bx)(Bgna^4d^2i^2-4Bgna^3bcdi^2+6Bgna^2b^2c^2i^2)}{12b^2}+\frac{Abd^2gi^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)*(B*a*c^2*g*i^2*x + (B*c*g*i^2*x^2*(2*a*d + b
*c))/2 + (B*d*g*i^2*x^3*(a*d + 2*b*c))/3 + (B*b*d^2*g*i^2*x^4)/4) + x^3*((d
*g*i^2*(8*A*a*d + 12*A*b*c + B*a*d*n - B*b*c*n))/12 - (A*d*g*i^2*(12*a*d +
12*b*c))/36) + x*(((12*a*d + 12*b*c)*((((d*g*i^2*(8*A*a*d + 12*A*b*c + B*a*
```

```
d*n - B*b*c*n))/4 - (A*d*g*i^2*(12*a*d + 12*b*c))/12)*(12*a*d + 12*b*c))/(1
2*b*d) - (g*i^2*(3*A*a^2*d^2 + 9*A*b^2*c^2 + B*a^2*d^2*n - 2*B*b^2*c^2*n +
18*A*a*b*c*d + B*a*b*c*d*n))/(3*b) + A*a*c*d*g*i^2))/(12*b*d) - (a*c*((d*g*
i^2*(8*A*a*d + 12*A*b*c + B*a*d*n - B*b*c*n))/4 - (A*d*g*i^2*(12*a*d + 12*b
*c))/12))/(b*d) + (c*g*i^2*(6*A*a^2*d^2 + 2*A*b^2*c^2 + 2*B*a^2*d^2*n - B*b
^2*c^2*n + 12*A*a*b*c*d - B*a*b*c*d*n))/(2*b*d)) - x^2*((((d*g*i^2*(8*A*a*d
 + 12*A*b*c + B*a*d*n - B*b*c*n))/4 - (A*d*g*i^2*(12*a*d + 12*b*c))/12)*(12
*a*d + 12*b*c))/(24*b*d) - (g*i^2*(3*A*a^2*d^2 + 9*A*b^2*c^2 + B*a^2*d^2*n
- 2*B*b^2*c^2*n + 18*A*a*b*c*d + B*a*b*c*d*n))/(6*b) + (A*a*c*d*g*i^2)/2) +
 (log(c + d*x)*(B*b*c^4*g*i^2*n - 4*B*a*c^3*d*g*i^2*n))/(12*d^2) + (log(a +
 b*x)*(B*a^4*d^2*g*i^2*n + 6*B*a^2*b^2*c^2*g*i^2*n - 4*B*a^3*b*c*d*g*i^2*n)
)/(12*b^3) + (A*b*d^2*g*i^2*x^4)/4
```

3.120 $\int (ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=124

$$-\frac{B(bc-ad)^2i^2nx}{3b^2}-\frac{B(bc-ad)i^2n(c+dx)^2}{6bd}-\frac{B(bc-ad)^3i^2n\log(a+bx)}{3b^3d}+\frac{i^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d}$$

```
[Out] -1/3*B*(-a*d+b*c)^2*i^2*n*x/b^2-1/6*B*(-a*d+b*c)*i^2*n*(d*x+c)^2/b/d-1/3*B*
(-a*d+b*c)^3*i^2*n*ln(b*x+a)/b^3/d+1/3*i^2*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*
x+c))^n))/d
```

Rubi [A]
time = 0.05, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2547, 21, 45}

$$\frac{i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d}-\frac{Bi^2n(bc-ad)^3\log(a+bx)}{3b^3d}-\frac{Bi^2nx(bc-ad)^2}{3b^2}-\frac{Bi^2n(c+dx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -1/3*(B*(b*c - a*d)^2*i^2*n*x)/b^2 - (B*(b*c - a*d)*i^2*n*(c + d*x)^2)/(6*b
*d) - (B*(b*c - a*d)^3*i^2*n*Log[a + b*x])/(3*b^3*d) + (i^2*(c + d*x)^3*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2547

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*((A +
 B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 1))), x] - Dist[B*n*((b*c - a*d)
/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ
[{a, b, c, d, e, f, g, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &
```

```
& NeQ[m, -2]
```

Rubi steps

$$\int (120c+120dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx=\frac{4800(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d}-\frac{(Bn)\int 17\ldots}{}$$

$$=\frac{4800(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d}-\frac{(4800B(b\ldots}{}$$

$$=\frac{4800(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d}-\frac{(4800B(b\ldots}{}$$

$$=-\frac{4800B(bc-ad)^2nx}{b^2}-\frac{2400B(bc-ad)n(c+dx)^2\ldots}{bd}$$

Mathematica [A]
time = 0.04, size = 101, normalized size = 0.81

$$\frac{i^2\left(-\frac{B(bc-ad)n\left(2bd(bc-ad)x+b^2(c+dx)^2+2(bc-ad)^2\log(a+bx)\right)}{2b^3}+(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (i^2*(-1/2*(B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c
 - a*d)^2*Log[a + b*x]))/b^3 + (c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])))/(3*d)
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int (dix+ci)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 289 vs. 2(105) = 210.
time = 0.27, size = 289, normalized size = 2.33

$$-\frac{1}{3}Bd^2x^3\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)-\frac{1}{3}Ad^2x^3-Bcdx^2\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)-Acdx^2-\frac{1}{6}Bd^2n\left(\frac{2a^3\log(bx+a)}{b^3}-\frac{2c^3\log(dx+c)}{d^3}-\frac{(b^2cd-abd^2)x^2-2(b^2c^2-a^2d^2)x}{b^2d^2}\right)+Bcdn\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)-Bc^2n\left(\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)-Bc^2x\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)-Ac^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] -1/3*B*d^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/3*A*d^2*x^3 - B*c
*d*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - A*c*d*x^2 - 1/6*B*d^2*n*(2*
a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 -
2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + B*c*d*n*(a^2*log(b*x + a)/b^2 - c^2*l
og(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - B*c^2*n*(a*log(b*x + a)/b - c*log(
d*x + c)/d) - B*c^2*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - A*c^2*x
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 232 vs. $2(105) = 210$.
time = 0.42, size = 232, normalized size = 1.87

$$-\frac{2\,(A+B)b^3d^3x^3-2\,Bb^3c^3n\log\left(\frac{dx+c}{d}\right)+(6\,(A+B)b^3cd^2-(Bb^3cd^2-Bab^2d^3)n)x^2+2\,(3\,Bab^2c^2d-3\,Ba^2bcd^2+Ba^3d^3)n\log\left(\frac{bx+a}{b}\right)+2\,(3\,(A+B)b^3c^2d-(2\,Bb^3c^2d-3\,Bab^2cd^2+Ba^2bd^3)n)x+2\,(Bb^3d^3nx^3+3\,Bb^3cd^2nx^2+3\,Bb^3c^2dnx)\log\left(\frac{bx+a}{dx+c}\right)}{6\,b^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] -1/6*(2*(A + B)*b^3*d^3*x^3 - 2*B*b^3*c^3*n*log((d*x + c)/d) + (6*(A + B)*b
^3*c*d^2 - (B*b^3*c*d^2 - B*a*b^2*d^3)*n)*x^2 + 2*(3*B*a*b^2*c^2*d - 3*B*a^
2*b*c*d^2 + B*a^3*d^3)*n*log((b*x + a)/b) + 2*(3*(A + B)*b^3*c^2*d - (2*B*b
^3*c^2*d - 3*B*a*b^2*c*d^2 + B*a^2*b*d^3)*n)*x + 2*(B*b^3*d^3*n*x^3 + 3*B*b
^3*c*d^2*n*x^2 + 3*B*b^3*c^2*d*n*x)*log((b*x + a)/(d*x + c)))/(b^3*d)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 860 vs. $2(105) = 210$.
time = 3.11, size = 860, normalized size = 6.94

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] -1/6*(2*(B*b^4*c^4*n - 4*B*a*b^3*c^3*d*n + 6*B*a^2*b^2*c^2*d^2*n - 4*B*a^3*
b*c*d^3*n + B*a^4*d^4*n)*log((b*x + a)/(d*x + c))/(b^3*d - 3*(b*x + a)*b^2*
d^2/(d*x + c) + 3*(b*x + a)^2*b*d^3/(d*x + c)^2 - (b*x + a)^3*d^4/(d*x + c)
^3) - (3*B*b^6*c^4*n - 12*B*a*b^5*c^3*d*n - 5*(b*x + a)*B*b^5*c^4*d*n/(d*x
+ c) + 18*B*a^2*b^4*c^2*d^2*n + 20*(b*x + a)*B*a*b^4*c^3*d^2*n/(d*x + c) +
2*(b*x + a)^2*B*b^4*c^4*d^2*n/(d*x + c)^2 - 12*B*a^3*b^3*c*d^3*n - 30*(b*x
+ a)*B*a^2*b^3*c^2*d^3*n/(d*x + c) - 8*(b*x + a)^2*B*a*b^3*c^3*d^3*n/(d*x +
 c)^2 + 3*B*a^4*b^2*d^4*n + 20*(b*x + a)*B*a^3*b^2*c*d^4*n/(d*x + c) + 12*(
b*x + a)^2*B*a^2*b^2*c^2*d^4*n/(d*x + c)^2 - 5*(b*x + a)*B*a^4*b*d^5*n/(d*x
 + c) - 8*(b*x + a)^2*B*a^3*b*c*d^5*n/(d*x + c)^2 + 2*(b*x + a)^2*B*a^4*d^6
*n/(d*x + c)^2 - 2*A*b^6*c^4 - 2*B*b^6*c^4 + 8*A*a*b^5*c^3*d + 8*B*a*b^5*c^
3*d - 12*A*a^2*b^4*c^2*d^2 - 12*B*a^2*b^4*c^2*d^2 + 8*A*a^3*b^3*c*d^3 + 8*B
*a^3*b^3*c*d^3 - 2*A*a^4*b^2*d^4 - 2*B*a^4*b^2*d^4)/(b^5*d - 3*(b*x + a)*b^
4*d^2/(d*x + c) + 3*(b*x + a)^2*b^3*d^3/(d*x + c)^2 - (b*x + a)^3*b^2*d^4/(
d*x + c)^3) + 2*(B*b^4*c^4*n - 4*B*a*b^3*c^3*d*n + 6*B*a^2*b^2*c^2*d^2*n -
4*B*a^3*b*c*d^3*n + B*a^4*d^4*n)*log(b - (b*x + a)*d/(d*x + c))/(b^3*d) - 2
*(B*b^4*c^4*n - 4*B*a*b^3*c^3*d*n + 6*B*a^2*b^2*c^2*d^2*n - 4*B*a^3*b*c*d^3
*n + B*a^4*d^4*n)*log((b*x + a)/(d*x + c))/(b^3*d))*(b*c/(b*c - a*d)^2 - a*
d/(b*c - a*d)^2)
```

Mupad [B]
time = 4.62, size = 303, normalized size = 2.44

$$\ln\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\left(Bc^2i^2x+Bcdi^2x^2+\frac{Bd^2i^2x^3}{3}\right)-x\left(\frac{(3ad+3bc)\left(\frac{di^2(3Aad+9Abc+Badn-Bbcn)}{3b}-\frac{Adi^2(3ad+3bc)}{3b}\right)}{3bd}-\frac{ci^2(3Aad+3Abc+Badn-Bbcn)}{b}+\frac{Aacdi^2}{b}\right)+x^2\left(\frac{di^2(3Aad+9Abc+Badn-Bbcn)}{6b}-\frac{Adi^2(3ad+3bc)}{6b}\right)+\frac{\ln(a+bx)\left(Bna^3d^2i^2-3Bna^2bcdi^2+3Bnab^2c^2i^2\right)}{3b^3}+\frac{Ad^2i^2x^3}{3}-\frac{Bc^3i^2n\ln(c+dx)}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)*((B*d^2*i^2*x^3)/3 + B*c^2*i^2*x + B*c*d*i^2
*x^2) - x*(((3*a*d + 3*b*c)*((d*i^2*(3*A*a*d + 9*A*b*c + B*a*d*n - B*b*c*n)
)/(3*b) - (A*d*i^2*(3*a*d + 3*b*c))/(3*b)))/(3*b*d) - (c*i^2*(3*A*a*d + 3*A
*b*c + B*a*d*n - B*b*c*n))/b + (A*a*c*d*i^2)/b) + x^2*((d*i^2*(3*A*a*d + 9*
A*b*c + B*a*d*n - B*b*c*n))/(6*b) - (A*d*i^2*(3*a*d + 3*b*c))/(6*b)) + (log
(a + b*x)*(B*a^3*d^2*i^2*n + 3*B*a*b^2*c^2*i^2*n - 3*B*a^2*b*c*d*i^2*n))/(3
*b^3) + (A*d^2*i^2*x^3)/3 - (B*c^3*i^2*n*log(c + d*x))/(3*d)
```

3.121 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=289

$$-\frac{Bd(bc-ad)i^2nx}{2b^2g}+\frac{d(bc-ad)i^2(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g}+\frac{i^2(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2bg}-B($$

```
[Out] -1/2*B*d*(-a*d+b*c)*i^2*n*x/b^2/g+d*(-a*d+b*c)*i^2*(b*x+a)*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))/b^3/g+1/2*i^2*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/g
-1/2*B*(-a*d+b*c)^2*i^2*n*ln((b*x+a)/(d*x+c))/b^3/g-3/2*B*(-a*d+b*c)^2*i^2*
n*ln(d*x+c)/b^3/g-(-a*d+b*c)^2*i^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(
d*x+c)/d/(b*x+a))/b^3/g+B*(-a*d+b*c)^2*i^2*n*polylog(2,b*(d*x+c)/d/(b*x+a))
/b^3/g
```

Rubi [A]

time = 0.25, antiderivative size = 289, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.186$, Rules used = {2561, 2389, 2379, 2438, 2351, 31, 2356, 46}

$$\frac{Bi^2n(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g}+\frac{di^2(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g}-\frac{i^2(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g}+\frac{i^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2bg}-\frac{Bi^2n(bc-ad)^2\log\left(\frac{a+bx}{c+dx}\right)}{2b^3g}-\frac{3Bi^2n(bc-ad)^2\log(c+dx)}{2b^3g}-\frac{Bdi^2nx(bc-ad)}{2b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x),
x]
```

```
[Out] -1/2*(B*d*(b*c - a*d)*i^2*n*x)/(b^2*g) + (d*(b*c - a*d)*i^2*(a + b*x)*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]))/(2*b*g) - (B*(b*c - a*d)^2*i^2*n*Log[(a + b*x)/(
c + d*x)])/(2*b^3*g) - (3*B*(b*c - a*d)^2*i^2*n*Log[c + d*x])/(2*b^3*g) - (
(b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*
x))/(d*(a + b*x))])/(b^3*g) + (B*(b*c - a*d)^2*i^2*n*PolyLog[2, (b*(c + d*x
))/(d*(a + b*x))])/(b^3*g)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(121c+121dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx = \int \left(\frac{14641d(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g} + \frac{121d(121c\right.$$

$$= \frac{\left(14641(bc-ad)^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ag+bgx}\,dx}{b^2} + \frac{(121d)\int(121c\ }{}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} + \frac{14641(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{2bg}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} + \frac{14641Bd(bc-ad)(a+bx)\log\left(e\left(\frac{a+}{c+}\right.\right.}{b^3g}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} + \frac{14641Bd(bc-ad)(a+bx)\log\left(e\left(\frac{a+}{c+}\right.\right.}{b^3g}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} - \frac{14641Bd(bc-ad)nx}{2b^2g} - \frac{14641B(bc}{}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} - \frac{14641Bd(bc-ad)nx}{2b^2g} - \frac{14641B(bc}{}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} - \frac{14641Bd(bc-ad)nx}{2b^2g} - \frac{14641B(bc}{}$$

Mathematica [A]
time = 0.13, size = 264, normalized size = 0.91

$$\frac{i^2\left(2Abd(bc-ad)x-B(bc-ad)n(bdx+(bc-ad)\log(a+bx))+2Bd(bc-ad)(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+b^2(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2(bc-ad)^2\log(g(a+bx))\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-2B(bc-ad)^2n\log(c+dx)+B(bc-ad)^2n\left(-\log(g(a+bx))\left(\log(g(a+bx))-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{2b^3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x),x]
```

```
[Out] (i^2*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a +
b*x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2*(c
 + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c - a*d)^2*Log[g*(a
 + b*x)]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c
 + d*x] + B*(b*c - a*d)^2*n*(-(Log[g*(a + b*x)]*(Log[g*(a + b*x)] - 2*Log[(
b*(c + d*x))/(b*c - a*d)])) + 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))
/(2*b^3*g)
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

Maxima [A]
time = 0.54, size = 463, normalized size = 1.60

$$-2\,Acd\left(\frac{x}{bg}-\frac{a\log(bx+a)}{b^2g}\right)-\frac{1}{2}\,Ad^2\left(\frac{2\,a^2\log(bx+a)}{b^3g}+\frac{bx^2-2\,ax}{b^2g}\right)-\frac{Ac^2\log(bgx+ag)}{bg}+\frac{(3\,bc^2n-2\,acdn)B\log(dx+c)}{2\,b^2g}-\frac{(b^2c^2n-2\,abcdn+a^2d^2n)\left(\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{b^3g}-\frac{Bb^2d^2x^2-(b^2c^2n-2\,abcdn+a^2d^2n)B\log(bx+a)^2+(abd^2(n-2)-b^2cd(n-4))Bx-(a^2d^2(3\,n-2)-4\,abcd(n-1)-2\,b^2c^2)B\log(bx+a)+(Bb^2d^2x^2+2\,(2\,b^2cd-abd^2)Bx+2\,(b^2c^2-2\,abcd+a^2d^2)B\log(bx+a))\log((bx+a)^n)-(Bb^2d^2x^2+2\,(2\,b^2cd-abd^2)Bx+2\,(b^2c^2-2\,abcd+a^2d^2)B\log(bx+a))\log((dx+c)^n)}{2\,b^3g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="maxima")
```

```
[Out] -2*A*c*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - 1/2*A*d^2*(2*a^2*log(b*x + a)
/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) - A*c^2*log(b*g*x + a*g)/(b*g) + 1/2*(3
*b*c^2*n - 2*a*c*d*n)*B*log(d*x + c)/(b^2*g) - (b^2*c^2*n - 2*a*b*c*d*n + a
^2*d^2*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x
+ a*d)/(b*c - a*d)))*B/(b^3*g) - 1/2*(B*b^2*d^2*x^2 - (b^2*c^2*n - 2*a*b*c*
d*n + a^2*d^2*n)*B*log(b*x + a)^2 + (a*b*d^2*(n - 2) - b^2*c*d*(n - 4))*B*x
 - (a^2*d^2*(3*n - 2) - 4*a*b*c*d*(n - 1) - 2*b^2*c^2)*B*log(b*x + a) + (B*
b^2*d^2*x^2 + 2*(2*b^2*c*d - a*b*d^2)*B*x + 2*(b^2*c^2 - 2*a*b*c*d + a^2*d^
2)*B*log(b*x + a))*log((b*x + a)^n) - (B*b^2*d^2*x^2 + 2*(2*b^2*c*d - a*b*d
^2)*B*x + 2*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)*B*log(b*x + a))*log((d*x + c)^n
))/(b^3*g)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="fricas")
```

```
[Out] integral(-((A + B)*d^2*x^2 + 2*(A + B)*c*d*x + (A + B)*c^2 + (B*d^2*n*x^2 +
 2*B*c*d*n*x + B*c^2*n)*log((b*x + a)/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^2\left(\int\frac{Ac^2}{a+bx}\,dx+\int\frac{Ad^2x^2}{a+bx}\,dx+\int\frac{Bc^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx+\int\frac{2Acdx}{a+bx}\,dx+\int\frac{Bd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx+\int\frac{2Bcdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g),x)
```

```
[Out] i**2*(Integral(A*c**2/(a + b*x), x) + Integral(A*d**2*x**2/(a + b*x), x) +
Integral(B*c**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x) + Int
egral(2*A*c*d*x/(a + b*x), x) + Integral(B*d**2*x**2*log(e*(a/(c + d*x) + b
*x/(c + d*x))**n)/(a + b*x), x) + Integral(2*B*c*d*x*log(e*(a/(c + d*x) + b
*x/(c + d*x))**n)/(a + b*x), x))/g
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(b*g*x + a
*g), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{a\,g+b\,g\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x),
x)
```

```
[Out] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x),
 x)
```

3.122 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=259

$$-\frac{B(bc-ad)i^2n(c+dx)}{b^2g^2(a+bx)}+\frac{d^2i^2(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^2}-\frac{(bc-ad)i^2(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{b^2g^2(a+bx)}$$

```
[Out] -B*(-a*d+b*c)*i^2*n*(d*x+c)/b^2/g^2/(b*x+a)+d^2*i^2*(b*x+a)*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))/b^3/g^2-(-a*d+b*c)*i^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))
^n))/b^2/g^2/(b*x+a)-B*d*(-a*d+b*c)*i^2*n*ln(d*x+c)/b^3/g^2-2*d*(-a*d+b*c)*
i^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x+a))/b^3/g^2+2*B*d
*(-a*d+b*c)*i^2*n*polylog(2,b*(d*x+c)/d/(b*x+a))/b^3/g^2
```

Rubi [A]
time = 0.22, antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.186$, Rules used = {2561, 46, 2393, 2341, 2351, 31, 2379, 2438}

$$\frac{2Bdi^2n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^2}+\frac{d^2i^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^2}-\frac{2di^2(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^2}-\frac{i^2(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^2(a+bx)}-\frac{Bdi^2n(bc-ad)\log(c+dx)}{b^3g^2}-\frac{Bi^2n(c+dx)(bc-ad)}{b^2g^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
2,x]
```

```
[Out] -((B*(b*c - a*d)*i^2*n*(c + d*x))/(b^2*g^2*(a + b*x))) + (d^2*i^2*(a + b*x)
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^2) - ((b*c - a*d)*i^2*(c +
d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*g^2*(a + b*x)) - (B*d*(b*
c - a*d)*i^2*n*Log[c + d*x])/(b^3*g^2) - (2*d*(b*c - a*d)*i^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2) +
 (2*B*d*(b*c - a*d)*i^2*n*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2
)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(122c+122dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx = \int \left(\frac{14884d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2} + \frac{14884(bc-ad)^2\,(}{b^2g^2}\right.$$

$$= \frac{(14884d^2)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{b^2g^2} + \frac{(29768d(bc-a}{}$$

$$= \frac{14884Ad^2x}{b^2g^2} - \frac{14884(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^2(a+bx)} +$$

$$= \frac{14884Ad^2x}{b^2g^2} + \frac{14884Bd^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^2} - \frac{14884}{}$$

$$= \frac{14884Ad^2x}{b^2g^2} + \frac{14884Bd^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^2} - \frac{14884}{}$$

$$= \frac{14884Ad^2x}{b^2g^2} - \frac{14884B(bc-ad)^2n}{b^3g^2(a+bx)} - \frac{14884Bd(bc-ad)n}{b^3g^2}$$

$$= \frac{14884Ad^2x}{b^2g^2} - \frac{14884B(bc-ad)^2n}{b^3g^2(a+bx)} - \frac{14884Bd(bc-ad)n}{b^3g^2}$$

$$= \frac{14884Ad^2x}{b^2g^2} - \frac{14884B(bc-ad)^2n}{b^3g^2(a+bx)} - \frac{14884Bd(bc-ad)n}{b^3g^2}$$

Mathematica [A]
time = 0.16, size = 233, normalized size = 0.90

$$\frac{i^2\left(Abd^2x - \frac{B(bc-ad)^2n}{a+bx} + Bd(-bc+ad)n\log(a+bx) + Bd^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) - \frac{(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx} + 2d(bc-ad)\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) + Bd(-bc+ad)n\left(\log(a+bx)\left(\log(a+bx) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{b^3g^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^2,x]
```

```
[Out] (i^2*(A*b*d^2*x - (B*(b*c - a*d)^2*n)/(a + b*x) + B*d*(-(b*c) + a*d)*n*Log[
a + b*x] + B*d^2*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - ((b*c - a*d)^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + 2*d*(b*c - a*d)*Log[a +
 b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + B*d*(-(b*c) + a*d)*n*(Log[a
+ b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)])))/(b^3*g^2)
```

Maple [F]

time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 966 vs. 2(241) = 482.
time = 0.54, size = 966, normalized size = 3.73

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="maxima")
```

```
[Out] B*c^2*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d
*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + A*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(
b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*d^2 - 2*A*c*d*(a/(b^3*g^2*x + a*b^2*
g^2) + log(b*x + a)/(b^2*g^2)) + B*c^2*log((b*x/(d*x + c) + a/(d*x + c))^n*
e)/(b^2*g^2*x + a*b*g^2) + A*c^2/(b^2*g^2*x + a*b*g^2) + (b^2*c^2*d*n + a*b
*c*d^2*n - a^2*d^3*n)*B*log(d*x + c)/(b^4*c*g^2 - a*b^3*d*g^2) - ((b^3*c*d^
2 - a*b^2*d^3)*B*x^2 + (a*b^2*c*d^2 - a^2*b*d^3)*B*x - ((b^3*c^2*d*n - 2*a*
b^2*c*d^2*n + a^2*b*d^3*n)*B*x + (a*b^2*c^2*d*n - 2*a^2*b*c*d^2*n + a^3*d^3
*n)*B)*log(b*x + a)^2 + (2*a*b^2*c^2*d*(n + 1) - 3*a^2*b*c*d^2*(n + 1) + a^
3*d^3*(n + 1))*B + ((a*b^2*c*d^2*(3*n - 4) - 2*a^2*b*d^3*(n - 1) + 2*b^3*c^
2*d)*B*x + (a^2*b*c*d^2*(3*n - 4) - 2*a^3*d^3*(n - 1) + 2*a*b^2*c^2*d)*B)*l
og(b*x + a) + ((b^3*c*d^2 - a*b^2*d^3)*B*x^2 + (a*b^2*c*d^2 - a^2*b*d^3)*B*
x + (2*a*b^2*c^2*d - 3*a^2*b*c*d^2 + a^3*d^3)*B + 2*((b^3*c^2*d - 2*a*b^2*c
*d^2 + a^2*b*d^3)*B*x + (a*b^2*c^2*d - 2*a^2*b*c*d^2 + a^3*d^3)*B)*log(b*x
+ a))*log((b*x + a)^n) - ((b^3*c*d^2 - a*b^2*d^3)*B*x^2 + (a*b^2*c*d^2 - a^
2*b*d^3)*B*x + (2*a*b^2*c^2*d - 3*a^2*b*c*d^2 + a^3*d^3)*B + 2*((b^3*c^2*d
- 2*a*b^2*c*d^2 + a^2*b*d^3)*B*x + (a*b^2*c^2*d - 2*a^2*b*c*d^2 + a^3*d^3)*
B)*log(b*x + a))*log((d*x + c)^n))/(a*b^4*c*g^2 - a^2*b^3*d*g^2 + (b^5*c*g^
2 - a*b^4*d*g^2)*x) - 2*(b*c*d*n - a*d^2*n)*(log(b*x + a)*log((b*d*x + a*d)
/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^3*g^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="fricas")
```

```
[Out] integral(-((A + B)*d^2*x^2 + 2*(A + B)*c*d*x + (A + B)*c^2 + (B*d^2*n*x^2 +
 2*B*c*d*n*x + B*c^2*n)*log((b*x + a)/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*
x + a^2*g^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(b*g*x + a
*g)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{(a\,g+b\,g\,x)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
2,x)
```

```
[Out] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
2, x)
```

3.123 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=242

$$-\frac{Bdi^2n(c+dx)}{b^2g^3(a+bx)}-\frac{Bi^2n(c+dx)^2}{4bg^3(a+bx)^2}-\frac{di^2(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)}-\frac{i^2(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2bg^3(a+bx)^2}$$

```
[Out] -B*d*i^2*n*(d*x+c)/b^2/g^3/(b*x+a)-1/4*B*i^2*n*(d*x+c)^2/b/g^3/(b*x+a)^2-d*
i^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/g^3/(b*x+a)-1/2*i^2*(d*x+c)
^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/g^3/(b*x+a)^2-d^2*i^2*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x+a))/b^3/g^3+B*d^2*i^2*n*polylog(2,b*(
d*x+c)/d/(b*x+a))/b^3/g^3
```

Rubi [A]
time = 0.22, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.116, Rules used = {2561, 2380, 2341, 2379, 2438}

$$\frac{Bd^2i^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^3}-\frac{d^2i^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^3}-\frac{di^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^3(a+bx)}-\frac{i^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2bg^3(a+bx)^2}-\frac{Bdi^2n(c+dx)}{b^2g^3(a+bx)}-\frac{Bi^2n(c+dx)^2}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
3,x]
```

```
[Out] -((B*d*i^2*n*(c + d*x))/(b^2*g^3*(a + b*x))) - (B*i^2*n*(c + d*x)^2)/(4*b*g
^3*(a + b*x)^2) - (d*i^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(b^2*g^3*(a + b*x)) - (i^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]))/(2*b*g^3*(a + b*x)^2) - (d^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3) + (B*d^2*i^2*n*PolyLog[2,
(b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(123c+123dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx = \int \left(\frac{15129(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)^3} + \frac{30258d(bc\right.$$

$$= \frac{(15129d^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{b^2g^3} + \frac{(30258d(bc-ad))\int \frac{A+}{}}{b^2g^3}$$

$$= -\frac{15129(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^3g^3(a+bx)^2} - \frac{30258d(bc-}{}$$

$$= -\frac{15129(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^3g^3(a+bx)^2} - \frac{30258d(bc-}{}$$

$$= -\frac{15129(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^3g^3(a+bx)^2} - \frac{30258d(bc-}{}$$

$$= -\frac{15129B(bc-ad)^2n}{4b^3g^3(a+bx)^2} - \frac{45387Bd(bc-ad)n}{2b^3g^3(a+bx)} - \frac{45387Bd^2n}{2b}$$

$$= -\frac{15129B(bc-ad)^2n}{4b^3g^3(a+bx)^2} - \frac{45387Bd(bc-ad)n}{2b^3g^3(a+bx)} - \frac{45387Bd^2n}{2b}$$

$$= -\frac{15129B(bc-ad)^2n}{4b^3g^3(a+bx)^2} - \frac{45387Bd(bc-ad)n}{2b^3g^3(a+bx)} - \frac{45387Bd^2n}{2b}$$

Mathematica [A]
time = 0.23, size = 258, normalized size = 1.07

$$\frac{i^2\left(-\frac{B(bc-ad)^2n}{(a+bx)^2}+\frac{6Bd(-bc+ad)n}{a+bx}-6Bd^2n\log(a+bx)-\frac{2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)^2}+\frac{8d(-bc+ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx}+4d^2\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+6Bd^2n\log(c+dx)-2Bd^2n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{4b^3g^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^3,x]
```

```
[Out] (i^2*(-((B*(b*c - a*d)^2*n)/(a + b*x)^2) + (6*B*d*(-(b*c) + a*d)*n)/(a + b*
x) - 6*B*d^2*n*Log[a + b*x] - (2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n]))/(a + b*x)^2 + (8*d*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(a + b*x) + 4*d^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]) + 6*B*d^2*n*Log[c + d*x] - 2*B*d^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*
Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)
])))/(4*b^3*g^3)
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B*c*d*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g
^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(
2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) -
 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^
3)) - 1/4*B*c^2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(
a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a
)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2
- 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A*d^2*((4*a*b*x + 3*a^2)/(b^5*g^3*x^
2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) - 1/2*B*d^2*((
(4*a*b*x + 3*a^2 + 2*(b^2*x^2 + 2*a*b*x + a^2)*log(b*x + a))*log((b*x + a)^
n) - (4*a*b*x + 3*a^2 + 2*(b^2*x^2 + 2*a*b*x + a^2)*log(b*x + a))*log((d*x
+ c)^n))/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*integrate(1/2*(2*b
^3*d*x^3 + 2*b^3*c*x^2 - 3*a^2*b*c*n + 3*a^3*d*n - 4*(a*b^2*c*n - a^2*b*d*n
)*x - 2*(a^2*b*c*n - a^3*d*n + (b^3*c*n - a*b^2*d*n)*x^2 + 2*(a*b^2*c*n - a
^2*b*d*n)*x)*log(b*x + a))/(b^6*d*g^3*x^4 + a^3*b^3*c*g^3 + (b^6*c*g^3 + 3*
a*b^5*d*g^3)*x^3 + 3*(a*b^5*c*g^3 + a^2*b^4*d*g^3)*x^2 + (3*a^2*b^4*c*g^3 +
 a^3*b^3*d*g^3)*x), x)) + (2*b*x + a)*B*c*d*log((b*x/(d*x + c) + a/(d*x + c
))^n*e)/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (2*b*x + a)*A*c*d/(b^
4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + 1/2*B*c^2*log((b*x/(d*x + c) + a
/(d*x + c))^n*e)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 1/2*A*c^2/(b^3
*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="fricas")
```

```
[Out] integral(-((A + B)*d^2*x^2 + 2*(A + B)*c*d*x + (A + B)*c^2 + (B*d^2*n*x^2 +
 2*B*c*d*n*x + B*c^2*n)*log((b*x + a)/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2*g^
3*x^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^2\left(\int \frac{Ac^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{Ad^2x^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{Bc^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{2Acdx}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{Bd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{2Bcdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx\right)}{g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3,x)
```

```
[Out] i**2*(Integral(A*c**2/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) +
 Integral(A*d**2*x**2/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) +
 Integral(B*c**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**3 + 3*a**2*b*x
 + 3*a*b**2*x**2 + b**3*x**3), x) + Integral(2*A*c*d*x/(a**3 + 3*a**2*b*x +
 3*a*b**2*x**2 + b**3*x**3), x) + Integral(B*d**2*x**2*log(e*(a/(c + d*x) +
 b*x/(c + d*x))**n)/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + I
ntegral(2*B*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**3 + 3*a**2*b*
x + 3*a*b**2*x**2 + b**3*x**3), x))/g**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(b*g*x + a
*g)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^2\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{\left(a\,g+b\,g\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
3,x)
```

```
[Out] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
3, x)
```

3.124 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=93

$$-\frac{Bi^2n(c+dx)^3}{9(bc-ad)g^4(a+bx)^3}-\frac{i^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3(bc-ad)g^4(a+bx)^3}$$

```
[Out] -1/9*B*i^2*n*(d*x+c)^3/(-a*d+b*c)/g^4/(b*x+a)^3-1/3*i^2*(d*x+c)^3*(A+B*ln(e
*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)/g^4/(b*x+a)^3
```

Rubi [A]
time = 0.07, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.047, Rules used = {2561, 2341}

$$-\frac{i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4(a+bx)^3(bc-ad)}-\frac{Bi^2n(c+dx)^3}{9g^4(a+bx)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
4,x]
```

```
[Out] -1/9*(B*i^2*n*(c + d*x)^3)/((b*c - a*d)*g^4*(a + b*x)^3) - (i^2*(c + d*x)^3
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)*g^4*(a + b*x)^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(124c+124dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx = \int \left(\frac{15376(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^4(a+bx)^4} + \frac{30752d(bc\right.$$

$$= \frac{(15376d^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}\,dx}{b^2g^4} + \frac{(30752d(bc-ad))\int \frac{A+}{}}{b^2g^4}$$

$$= -\frac{15376(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^3g^4(a+bx)^3} - \frac{15376d(bc-}{}$$

$$= -\frac{15376(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^3g^4(a+bx)^3} - \frac{15376d(bc-}{}$$

$$= -\frac{15376(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^3g^4(a+bx)^3} - \frac{15376d(bc-}{}$$

$$= -\frac{15376B(bc-ad)^2n}{9b^3g^4(a+bx)^3} - \frac{15376Bd(bc-ad)n}{3b^3g^4(a+bx)^2} - \frac{15376Bd^2}{3b^3g^4(a+b}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 329 vs. 2(93) = 186.
time = 0.22, size = 329, normalized size = 3.54

$$-\frac{i^2\left(3Ab^3c^3-3a^3Ad^3+b^3Bc^3n-a^3Bd^3n+9Ab^3c^2dx-9a^2Abd^3x+3b^3Bc^2dnx-3a^2bBd^3nx+9Ab^3cd^2x^2-9aAb^2d^3x^2+3b^3Bcd^2nx^2-3ab^2Bd^3nx^2+3Bd^3n(a+bx)^3\log(a+bx)+3B(bc-ad)\left(a^2d^2+abd(c+3dx)+b^2(c^2+3cdx+3d^2x^2)\right)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-3a^3Bd^3n\log(c+dx)-9a^2bBd^3nx\log(c+dx)-9ab^2Bd^3nx^2\log(c+dx)-3b^3Bd^3nx^3\log(c+dx)\right)}{9b^3(bc-ad)g^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^4,x]
```

```
[Out] -1/9*(i^2*(3*A*b^3*c^3 - 3*a^3*A*d^3 + b^3*B*c^3*n - a^3*B*d^3*n + 9*A*b^3*
c^2*d*x - 9*a^2*A*b*d^3*x + 3*b^3*B*c^2*d*n*x - 3*a^2*b*B*d^3*n*x + 9*A*b^3
*c*d^2*x^2 - 9*a*A*b^2*d^3*x^2 + 3*b^3*B*c*d^2*n*x^2 - 3*a*b^2*B*d^3*n*x^2
+ 3*B*d^3*n*(a + b*x)^3*Log[a + b*x] + 3*B*(b*c - a*d)*(a^2*d^2 + a*b*d*(c
+ 3*d*x) + b^2*(c^2 + 3*c*d*x + 3*d^2*x^2))*Log[e*((a + b*x)/(c + d*x))^n]
- 3*a^3*B*d^3*n*Log[c + d*x] - 9*a^2*b*B*d^3*n*x*Log[c + d*x] - 9*a*b^2*B*d
^3*n*x^2*Log[c + d*x] - 3*b^3*B*d^3*n*x^3*Log[c + d*x]))/(b^3*(b*c - a*d)*g
^4*(a + b*x)^3)
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1520 vs. $2(84) = 168$.
time = 0.35, size = 1520, normalized size = 16.34

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="maxima")
```

```
[Out] 1/18*B*d^2*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3*
a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^2
)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2*
b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d
^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*c^2
*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*
b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log
(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4))
+ 1/18*B*c^2*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^
2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a
*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^
3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4)
 + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d
^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
 a^3*b*d^3)*g^4)) + 1/18*B*c*d*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 -
 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)
*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b
^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^
2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2
- a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2
*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d +
 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) + 1/3*(3*b*x + a)*B*c*d*log((b*x/(d*x
 + c) + a/(d*x + c))^n*e)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x
+ a^3*b^2*g^4) + 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*B*d^2*log((b*x/(d*x + c) +
 a/(d*x + c))^n*e)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b
^3*g^4) + 1/3*(3*b*x + a)*A*c*d/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*
g^4*x + a^3*b^2*g^4) + 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*A*d^2/(b^6*g^4*x^3 +
 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + 1/3*B*c^2*log((b*x/(d*x
 + c) + a/(d*x + c))^n*e)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x
+ a^3*b*g^4) + 1/3*A*c^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x +
 a^3*b*g^4)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 304 vs. $2(84) = 168$.
time = 0.41, size = 304, normalized size = 3.27

$$\frac{3\,(A+B)b^3c^3-3\,(A+B)a^3d^3+3\,(3\,(A+B)b^3cd^2-3\,(A+B)ab^2d^3+(Bb^3cd^2-Bab^2d^3)n)x^2+(Bb^3c^3-Ba^3d^3)n+3\,(3\,(A+B)b^3c^2d-3\,(A+B)a^2bd^3+(Bb^3c^2d-Ba^2bd^3)n)x+3\,(Bb^3d^3nx^3+3\,Bb^3cd^2nx^2+3\,Bb^3c^2dnx+Bb^3c^3n)\log\left(\frac{bx+a}{dx+c}\right)}{9\,((b^7c-ab^6d)g^4x^3+3\,(ab^6c-a^2b^5d)g^4x^2+3\,(a^2b^5c-a^3b^4d)g^4x+(a^3b^4c-a^4b^3d)g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="fricas")
```

```
[Out] 1/9*(3*(A + B)*b^3*c^3 - 3*(A + B)*a^3*d^3 + 3*(3*(A + B)*b^3*c*d^2 - 3*(A
+ B)*a*b^2*d^3 + (B*b^3*c*d^2 - B*a*b^2*d^3)*n)*x^2 + (B*b^3*c^3 - B*a^3*d^
3)*n + 3*(3*(A + B)*b^3*c^2*d - 3*(A + B)*a^2*b*d^3 + (B*b^3*c^2*d - B*a^2*
b*d^3)*n)*x + 3*(B*b^3*d^3*n*x^3 + 3*B*b^3*c*d^2*n*x^2 + 3*B*b^3*c^2*d*n*x
+ B*b^3*c^3*n)*log((b*x + a)/(d*x + c)))/((b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*
b^6*c - a^2*b^5*d)*g^4*x^2 + 3*(a^2*b^5*c - a^3*b^4*d)*g^4*x + (a^3*b^4*c -
 a^4*b^3*d)*g^4)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4,x)
```

```
[Out] Timed out
```

Giac [A]
time = 5.11, size = 94, normalized size = 1.01

$$\frac{1}{9}\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)\left(\frac{3\,(dx+c)^3Bn\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)^3g^4}+\frac{(Bn+3\,A+3\,B)(dx+c)^3}{(bx+a)^3g^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="giac")
```

```
[Out] 1/9*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)*(3*(d*x + c)^3*B*n*log((b*x + a
)/(d*x + c))/((b*x + a)^3*g^4) + (B*n + 3*A + 3*B)*(d*x + c)^3/((b*x + a)^3
*g^4))
```

Mupad [B]
time = 5.62, size = 421, normalized size = 4.53

$$-\frac{x\,(3\,A\,a\,b\,d^2\,i^2+3\,A\,b^2\,c\,d\,i^2+B\,a\,b\,d^2\,i^2\,n+B\,b^2\,c\,d\,i^2\,n)+x^2\,(3\,A\,b^2\,d^2\,i^2+B\,b^2\,d^2\,i^2\,n)+A\,a^2\,d^2\,i^2+A\,b^2\,c^2\,i^2+\frac{B\,a^2\,d^2\,i^2\,n}{3}+\frac{B\,b^2\,c^2\,i^2\,n}{3}+A\,a\,b\,c\,d\,i^2+\frac{B\,a\,b\,c\,d\,i^2\,n}{3}}{3\,a^3\,b^3\,g^4+9\,a^2\,b^4\,g^4\,x+9\,a\,b^5\,g^4\,x^2+3\,b^6\,g^4\,x^3}-\frac{\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\,\left(a\left(\frac{B\,a\,d^2\,i^2}{3\,b^3}+\frac{B\,c\,d\,i^2}{3\,b^2}\right)+x\left(b\left(\frac{B\,a\,d^2\,i^2}{3\,b^3}+\frac{B\,c\,d\,i^2}{3\,b^2}\right)+\frac{2\,B\,a\,d^2\,i^2}{3\,b^2}+\frac{2\,B\,c\,d\,i^2}{3\,b}\right)+\frac{B\,c^2\,i^2}{3\,b}+\frac{B\,d^2\,i^2\,x^2}{b}\right)}{a^3\,g^4+3\,a^2\,b\,g^4\,x+3\,a\,b^2\,g^4\,x^2+b^3\,g^4\,x^3}-\frac{B\,d^3\,i^2\,n\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,2\mathrm{i}}{3\,b^3\,g^4\,(a\,d-b\,c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
4,x)
```

```
[Out] - (x*(3*A*a*b*d^2*i^2 + 3*A*b^2*c*d*i^2 + B*a*b*d^2*i^2*n + B*b^2*c*d*i^2*n
) + x^2*(3*A*b^2*d^2*i^2 + B*b^2*d^2*i^2*n) + A*a^2*d^2*i^2 + A*b^2*c^2*i^2
 + (B*a^2*d^2*i^2*n)/3 + (B*b^2*c^2*i^2*n)/3 + A*a*b*c*d*i^2 + (B*a*b*c*d*i
^2*n)/3)/(3*a^3*b^3*g^4 + 3*b^6*g^4*x^3 + 9*a^2*b^4*g^4*x + 9*a*b^5*g^4*x^2
) - (log(e*((a + b*x)/(c + d*x))^n)*(a*((B*a*d^2*i^2)/(3*b^3) + (B*c*d*i^2)
/(3*b^2)) + x*(b*((B*a*d^2*i^2)/(3*b^3) + (B*c*d*i^2)/(3*b^2)) + (2*B*a*d^2
*i^2)/(3*b^2) + (2*B*c*d*i^2)/(3*b)) + (B*c^2*i^2)/(3*b) + (B*d^2*i^2*x^2)/
b))/(a^3*g^4 + b^3*g^4*x^3 + 3*a*b^2*g^4*x^2 + 3*a^2*b*g^4*x) - (B*d^3*i^2*
n*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*2i)/(3*b^3*g^4*(a*d - b*c))
```

3.125 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=189

$$\frac{Bdi^2n(c+dx)^3}{9(bc-ad)^2g^5(a+bx)^3}-\frac{bBi^2n(c+dx)^4}{16(bc-ad)^2g^5(a+bx)^4}+\frac{di^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3(bc-ad)^2g^5(a+bx)^3}-\frac{bi^2(c+dx)^4\left(A+\right.}{4(bc-ad)^2}$$

```
[Out] 1/9*B*d*i^2*n*(d*x+c)^3/(-a*d+b*c)^2/g^5/(b*x+a)^3-1/16*b*B*i^2*n*(d*x+c)^4
/(-a*d+b*c)^2/g^5/(b*x+a)^4+1/3*d*i^2*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))
^n))/(-a*d+b*c)^2/g^5/(b*x+a)^3-1/4*b*i^2*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x
+c))^n))/(-a*d+b*c)^2/g^5/(b*x+a)^4
```

Rubi [A]
time = 0.11, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 45, 2372, 12}

$$-\frac{bi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^2}+\frac{di^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^2}-\frac{bBi^2n(c+dx)^4}{16g^5(a+bx)^4(bc-ad)^2}+\frac{Bdi^2n(c+dx)^3}{9g^5(a+bx)^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
5,x]
```

```
[Out] (B*d*i^2*n*(c + d*x)^3)/(9*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*B*i^2*n*(c +
 d*x)^4)/(16*(b*c - a*d)^2*g^5*(a + b*x)^4) + (d*i^2*(c + d*x)^3*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*i^2*(c
 + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*(b*c - a*d)^2*g^5*(a +
 b*x)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
```

```
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(125c+125dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}\,dx = \int \left(\frac{15625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^5(a+bx)^5} + \frac{31250d(b \ldots}{\ldots}\right.$$

$$= \frac{(15625d^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^3}\,dx}{b^2g^5} + \frac{(31250d(bc-ad))\int \frac{A \ldots}{\ldots}}{b^2g^5 \ldots}$$

$$= -\frac{15625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3g^5(a+bx)^4} - \frac{31250d(bc- \ldots}{\ldots}$$

$$= -\frac{15625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3g^5(a+bx)^4} - \frac{31250d(bc- \ldots}{\ldots}$$

$$= -\frac{15625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3g^5(a+bx)^4} - \frac{31250d(bc- \ldots}{\ldots}$$

$$= -\frac{15625B(bc-ad)^2n}{16b^3g^5(a+bx)^4} - \frac{78125Bd(bc-ad)n}{36b^3g^5(a+bx)^3} - \frac{15625B \ldots}{24b^3g^5(a \ldots}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 474 vs. 2(189) = 378.
time = 0.27, size = 474, normalized size = 2.51

$$-\frac{(bc-ad)^2i^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3g^5(a+bx)^4} - \frac{2d(bc-ad)i^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^3g^5(a+bx)^3} - \frac{d^2i^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^3g^5(a+bx)^2} - \frac{Bd^2i^2n\left(\frac{1}{(a+bx)^2} - \frac{2d}{(bc-ad)(a+bx)} - \frac{2d^2\log(a+bx)}{(bc-ad)^2} + \frac{2d^2\log(c+dx)}{(bc-ad)^2}\right)}{4b^3g^5} - \frac{Bdi^2n\left(\frac{2(bc-ad)}{(a+bx)^3} - \frac{3d}{(a+bx)^2} + \frac{6d^2}{(bc-ad)(a+bx)} + \frac{6d^3\log(a+bx)}{(bc-ad)^2} - \frac{6d^3\log(c+dx)}{(bc-ad)^2}\right)}{9b^3g^5} - \frac{Bi^2n\left(\frac{3(bc-ad)^2}{(a+bx)^4} - \frac{4d(bc-ad)}{(a+bx)^3} + \frac{6d^2}{(a+bx)^2} - \frac{12d^3}{(bc-ad)(a+bx)} - \frac{12d^4\log(a+bx)}{(bc-ad)^2} + \frac{12d^4\log(c+dx)}{(bc-ad)^2}\right)}{48b^3g^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^5,x]
```

```
[Out] -1/4*((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^5*(a
 + b*x)^4) - (2*d*(b*c - a*d)*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(
3*b^3*g^5*(a + b*x)^3) - (d^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(
2*b^3*g^5*(a + b*x)^2) - (B*d^2*i^2*n*((a + b*x)^(-2) - (2*d)/((b*c - a*d)*
(a + b*x)) - (2*d^2*Log[a + b*x])/(b*c - a*d)^2 + (2*d^2*Log[c + d*x])/(b*c
 - a*d)^2))/(4*b^3*g^5) - (B*d*i^2*n*((2*(b*c - a*d))/(a + b*x)^3 - (3*d)/(
a + b*x)^2 + (6*d^2)/((b*c - a*d)*(a + b*x)) + (6*d^3*Log[a + b*x])/(b*c -
a*d)^2 - (6*d^3*Log[c + d*x])/(b*c - a*d)^2))/(9*b^3*g^5) - (B*i^2*n*((3*(b
*c - a*d)^2)/(a + b*x)^4 - (4*d*(b*c - a*d))/(a + b*x)^3 + (6*d^2)/(a + b*x
)^2 - (12*d^3)/((b*c - a*d)*(a + b*x)) - (12*d^4*Log[a + b*x])/(b*c - a*d)^
2 + (12*d^4*Log[c + d*x])/(b*c - a*d)^2))/(48*b^3*g^5)
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 2223 vs. $2(171) = 342$.
time = 0.44, size = 2223, normalized size = 11.76

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, a
lgorithm="maxima")
```

```
[Out] -1/48*B*c^2*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^
2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c
*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b
^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^
4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b
^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*
b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d
^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^
2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a
*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) + 1/144
*B*d^2*n*((13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 -
 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b
```

^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2
*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d
+ 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d +
 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d
+ 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d
 + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d +
3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2
*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^
4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*lo
g(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3
+ a^4*b^3*d^4)*g^5)) + 1/72*B*c*d*n*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a
^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d
 - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57
*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d
^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^
2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d
^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*
d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2
 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*
b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4
*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^
2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) + 1/6*(4*b*x + a)*B*c*d*log((b*x/(
d*x + c) + a/(d*x + c))^n*e)/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5
*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + 1/12*(6*b^2*x^2 + 4*a*b*x + a^2)*B*
d^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 +
 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) + 1/6*(4*b*x + a)*A*c*d
/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4
*b^2*g^5) + 1/12*(6*b^2*x^2 + 4*a*b*x + a^2)*A*d^2/(b^7*g^5*x^4 + 4*a*b^6*g
^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) + 1/4*B*c^2*log
((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*
b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 1/4*A*c^2/(b^5*g^5*x^4 + 4*a*b
^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 567 vs. $2(171) = 342$.
time = 0.39, size = 567, normalized size = 3.00

$$\frac{36\,(A+B)b^4c^4 - 48\,(A+B)ab^3c^3d + 12\,(A+B)a^4d^4 - 12\,(Bb^4cd^3 - Bab^3d^4)nx^3 + 6\,(12\,(A+B)b^4c^2d^2 - 24\,(A+B)ab^3cd^3 + 12\,(A+B)a^2b^2d^4 + (Bb^4c^2d^2 - 8\,Bab^3cd^3 + 7\,Ba^2b^2d^4)n)x^2 + (9\,Bb^4c^4 - 16\,Bab^3c^3d + 7\,Ba^4d^4)n + 4\,(24\,(A+B)b^4c^3d - 36\,(A+B)ab^3c^2d^2 + 12\,(A+B)a^3bd^4 + (5\,Bb^4c^3d - 12\,Bab^3c^2d^2 + 7\,Ba^3bd^4)n)x - 12\,(Bb^4d^4nx^4 + 4\,Bab^3d^4nx^3 - 6\,(Bb^4c^2d^2 - 2\,Bab^3cd^3)nx^2 - 4\,(2\,Bb^4c^3d - 3\,Bab^3c^2d^2)nx - (3\,Bb^4c^4 - 4\,Bab^3c^3d)n)\log\left(\frac{bx+a}{dx+c}\right)}{144\,((b^9c^2 - 2\,ab^8cd + a^2b^7d^2)g^5x^4 + 4\,(ab^8c^2 - 2\,a^2b^7cd + a^3b^6d^2)g^5x^3 + 6\,(a^2b^7c^2 - 2\,a^3b^6cd + a^4b^5d^2)g^5x^2 + 4\,(a^3b^6c^2 - 2\,a^4b^5cd + a^5b^4d^2)g^5x + (a^4b^5c^2 - 2\,a^5b^4cd + a^6b^3d^2)g^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, a
lgorithm="fricas")

[Out] 1/144*(36*(A + B)*b^4*c^4 - 48*(A + B)*a*b^3*c^3*d + 12*(A + B)*a^4*d^4 - 1
2*(B*b^4*c*d^3 - B*a*b^3*d^4)*n*x^3 + 6*(12*(A + B)*b^4*c^2*d^2 - 24*(A + B

```
)*a*b^3*c*d^3 + 12*(A + B)*a^2*b^2*d^4 + (B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 +
 7*B*a^2*b^2*d^4)*n)*x^2 + (9*B*b^4*c^4 - 16*B*a*b^3*c^3*d + 7*B*a^4*d^4)*n
 + 4*(24*(A + B)*b^4*c^3*d - 36*(A + B)*a*b^3*c^2*d^2 + 12*(A + B)*a^3*b*d^
4 + (5*B*b^4*c^3*d - 12*B*a*b^3*c^2*d^2 + 7*B*a^3*b*d^4)*n)*x - 12*(B*b^4*d
^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3 - 6*(B*b^4*c^2*d^2 - 2*B*a*b^3*c*d^3)*n*x^2
- 4*(2*B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2)*n*x - (3*B*b^4*c^4 - 4*B*a*b^3*c^3*
d)*n)*log((b*x + a)/(d*x + c)))/((b^9*c^2 - 2*a*b^8*c*d + a^2*b^7*d^2)*g^5*
x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^3*b^6*d^2)*g^5*x^3 + 6*(a^2*b^7*c^2
- 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2 + 4*(a^3*b^6*c^2 - 2*a^4*b^5*c*d + a
^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^5*b^4*c*d + a^6*b^3*d^2)*g^5)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

$$\text{Timed out}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [A]
time = 6.68, size = 222, normalized size = 1.17

$$\frac{1}{144}\left(\frac{12\left(3\,Bbn-\frac{4\,(bx+a)Bdn}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^4bcg^5}{(dx+c)^4}-\frac{(bx+a)^4adg^5}{(dx+c)^4}}+\frac{9\,Bbn-\frac{16\,(bx+a)Bdn}{dx+c}+36\,Ab+36\,Bb-\frac{48\,(bx+a)Ad}{dx+c}-\frac{48\,(bx+a)Bd}{dx+c}}{\frac{(bx+a)^4bcg^5}{(dx+c)^4}-\frac{(bx+a)^4adg^5}{(dx+c)^4}}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, a
lgorithm="giac")
```

```
[Out] 1/144*(12*(3*B*b*n - 4*(b*x + a)*B*d*n/(d*x + c))*log((b*x + a)/(d*x + c))/
((b*x + a)^4*b*c*g^5/(d*x + c)^4 - (b*x + a)^4*a*d*g^5/(d*x + c)^4) + (9*B*
b*n - 16*(b*x + a)*B*d*n/(d*x + c) + 36*A*b + 36*B*b - 48*(b*x + a)*A*d/(d*
x + c) - 48*(b*x + a)*B*d/(d*x + c))/((b*x + a)^4*b*c*g^5/(d*x + c)^4 - (b*
x + a)^4*a*d*g^5/(d*x + c)^4))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 6.07, size = 652, normalized size = 3.45

$$-\frac{\frac{12\,A\,a^3\,d^3\,i^2-36\,A\,b^3\,c^3\,i^2+7\,B\,a^3\,d^3\,i^2\,n-9\,B\,b^3\,c^3\,i^2\,n+12\,A\,a\,b^2\,c^2\,d\,i^2+12\,A\,a^2\,b\,c\,d^2\,i^2+7\,B\,a\,b^2\,c^2\,d\,i^2\,n+7\,B\,a^2\,b\,c\,d^2\,i^2\,n}{12\,(a\,d-b\,c)}+\frac{x\,(12\,A\,a^2\,b\,d^3\,i^2-24\,A\,b^3\,c^2\,d\,i^2+12\,A\,a\,b^2\,c\,d^2\,i^2+7\,B\,a^2\,b\,d^3\,i^2\,n-5\,B\,b^3\,c^2\,d\,i^2\,n+7\,B\,a\,b^2\,c\,d^2\,i^2\,n)}{3\,(a\,d-b\,c)}+\frac{x^2\,(12\,A\,a\,b^2\,d^3\,i^2-12\,A\,b^3\,c\,d^2\,i^2+7\,B\,a\,b^2\,d^3\,i^2\,n-B\,b^3\,c\,d^2\,i^2\,n)}{2\,(a\,d-b\,c)}+\frac{B\,b^3\,d^3\,i^2\,n\,x^3}{a\,d-b\,c}}{12\,a^4\,b^3\,g^5+48\,a^3\,b^4\,g^5\,x+72\,a^2\,b^5\,g^5\,x^2+48\,a\,b^6\,g^5\,x^3+12\,b^7\,g^5\,x^4}-\frac{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,\left(a\,\left(\frac{B\,a\,d^2\,i^2}{12\,b^3}+\frac{B\,c\,d\,i^2}{6\,b^2}\right)+x\,\left(b\,\left(\frac{B\,a\,d^2\,i^2}{12\,b^3}+\frac{B\,c\,d\,i^2}{6\,b^2}\right)+\frac{B\,a\,d^2\,i^2}{4\,b^2}+\frac{B\,c\,d\,i^2}{2\,b}\right)+\frac{B\,c^2\,i^2}{4\,b}+\frac{B\,d^2\,i^2\,x^2}{2\,b}\right)}{a^4\,g^5+4\,a^3\,b\,g^5\,x+6\,a^2\,b^2\,g^5\,x^2+4\,a\,b^3\,g^5\,x^3+b^4\,g^5\,x^4}-\frac{B\,d^4\,i^2\,n\,\mathrm{atanh}\left(\frac{12\,b^5\,c^2\,g^5-12\,a^2\,b^3\,d^2\,g^5}{12\,b^3\,g^5\,{\left(a\,d-b\,c\right)}^2}-\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{6\,b^3\,g^5\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
5,x)
```

```
[Out] - ((12*A*a^3*d^3*i^2 - 36*A*b^3*c^3*i^2 + 7*B*a^3*d^3*i^2*n - 9*B*b^3*c^3*i
^2*n + 12*A*a*b^2*c^2*d*i^2 + 12*A*a^2*b*c*d^2*i^2 + 7*B*a*b^2*c^2*d*i^2*n
+ 7*B*a^2*b*c*d^2*i^2*n)/(12*(a*d - b*c)) + (x*(12*A*a^2*b*d^3*i^2 - 24*A*b
^3*c^2*d*i^2 + 12*A*a*b^2*c*d^2*i^2 + 7*B*a^2*b*d^3*i^2*n - 5*B*b^3*c^2*d*i
^2*n + 7*B*a*b^2*c*d^2*i^2*n))/(3*(a*d - b*c)) + (x^2*(12*A*a*b^2*d^3*i^2 -
 12*A*b^3*c*d^2*i^2 + 7*B*a*b^2*d^3*i^2*n - B*b^3*c*d^2*i^2*n))/(2*(a*d - b
*c)) + (B*b^3*d^3*i^2*n*x^3)/(a*d - b*c))/(12*a^4*b^3*g^5 + 12*b^7*g^5*x^4
+ 48*a^3*b^4*g^5*x + 48*a*b^6*g^5*x^3 + 72*a^2*b^5*g^5*x^2) - (log(e*((a +
b*x)/(c + d*x))^n)*(a*((B*a*d^2*i^2)/(12*b^3) + (B*c*d*i^2)/(6*b^2)) + x*(b
*((B*a*d^2*i^2)/(12*b^3) + (B*c*d*i^2)/(6*b^2)) + (B*a*d^2*i^2)/(4*b^2) + (
B*c*d*i^2)/(2*b)) + (B*c^2*i^2)/(4*b) + (B*d^2*i^2*x^2)/(2*b)))/(a^4*g^5 +
b^4*g^5*x^4 + 4*a*b^3*g^5*x^3 + 6*a^2*b^2*g^5*x^2 + 4*a^3*b*g^5*x) - (B*d^4
*i^2*n*atanh((12*b^5*c^2*g^5 - 12*a^2*b^3*d^2*g^5)/(12*b^3*g^5*(a*d - b*c)^
2) - (2*b*d*x)/(a*d - b*c)))/(6*b^3*g^5*(a*d - b*c)^2)
```

3.126 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=293

$$-\frac{Bd^2i^2n(c+dx)^3}{9(bc-ad)^3g^6(a+bx)^3}+\frac{bBdi^2n(c+dx)^4}{8(bc-ad)^3g^6(a+bx)^4}-\frac{b^2Bi^2n(c+dx)^5}{25(bc-ad)^3g^6(a+bx)^5}-\frac{d^2i^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a-}{c-}\right.\right.\right.}{3(bc-ad)^3g^6(a+bx)^3}$$

```
[Out] -1/9*B*d^2*i^2*n*(d*x+c)^3/(-a*d+b*c)^3/g^6/(b*x+a)^3+1/8*b*B*d*i^2*n*(d*x+
c)^4/(-a*d+b*c)^3/g^6/(b*x+a)^4-1/25*b^2*B*i^2*n*(d*x+c)^5/(-a*d+b*c)^3/g^6
/(b*x+a)^5-1/3*d^2*i^2*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)
^3/g^6/(b*x+a)^3+1/2*b*d*i^2*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*
d+b*c)^3/g^6/(b*x+a)^4-1/5*b^2*i^2*(d*x+c)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n)
)/(-a*d+b*c)^3/g^6/(b*x+a)^5
```

Rubi [A]
time = 0.15, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.116$, Rules used = {2561, 45, 2372, 12, 14}

$$-\frac{b^2i^2(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5g^6(a+bx)^5(bc-ad)^3}-\frac{d^2i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^6(a+bx)^3(bc-ad)^3}+\frac{bdi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^6(a+bx)^4(bc-ad)^3}-\frac{b^2Bi^2n(c+dx)^5}{25g^6(a+bx)^5(bc-ad)^3}-\frac{Bd^2i^2n(c+dx)^3}{9g^6(a+bx)^3(bc-ad)^3}+\frac{bBdi^2n(c+dx)^4}{8g^6(a+bx)^4(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
6,x]
```

```
[Out] -1/9*(B*d^2*i^2*n*(c + d*x)^3)/((b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B*d*i^2
*n*(c + d*x)^4)/(8*(b*c - a*d)^3*g^6*(a + b*x)^4) - (b^2*B*i^2*n*(c + d*x)^
5)/(25*(b*c - a*d)^3*g^6*(a + b*x)^5) - (d^2*i^2*(c + d*x)^3*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*d*i^2*(c +
 d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g^6*(a + b
*x)^4) - (b^2*i^2*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*(b
*c - a*d)^3*g^6*(a + b*x)^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(126c+126dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^6}\,dx = \int \left(\frac{15876(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^6(a+bx)^6}+\frac{31752d(b$$

$$=\frac{(15876d^2)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^4}\,dx}{b^2g^6}+\frac{(31752d(bc-ad))\int\frac{A}{}}{b^2g^6}$$

$$=-\frac{15876(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5b^3g^6(a+bx)^5}-\frac{7938d(bc-}{}$$

$$=-\frac{15876(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5b^3g^6(a+bx)^5}-\frac{7938d(bc-}{}$$

$$=-\frac{15876(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5b^3g^6(a+bx)^5}-\frac{7938d(bc-}{}$$

$$=-\frac{15876B(bc-ad)^2n}{25b^3g^6(a+bx)^5}-\frac{11907Bd(bc-ad)n}{10b^3g^6(a+bx)^4}-\frac{882Bd}{5b^3g^6(a+}$$

Mathematica [A]

time = 0.65, size = 357, normalized size = 1.22

$$\frac{i^2\left(-\frac{360Ab^2c^2}{(a+bx)^5}+\frac{720aAbcd}{(a+bx)^5}-\frac{360a^2Ad^2}{(a+bx)^5}-\frac{72b^2Bc^2n}{(a+bx)^5}+\frac{144abBcdn}{(a+bx)^5}-\frac{72a^2Bd^2n}{(a+bx)^5}-\frac{900Abcd}{(a+bx)^4}+\frac{900aAd^2}{(a+bx)^4}-\frac{135bBcdn}{(a+bx)^4}+\frac{135aBd^2n}{(a+bx)^4}-\frac{600Ad^2}{(a+bx)^3}-\frac{20Bd^2n}{(a+bx)^3}+\frac{30Bd^3n}{(bc-ad)(a+bx)^2}-\frac{60Bd^4n}{(bc-ad)^2(a+bx)}-\frac{60Bd^5n\log(a+bx)}{(bc-ad)^3}-\frac{60B(a^2d^2+abd(3c+5dx)+b^2(6c^2+15cdx+10d^2x^2))\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^5}+\frac{60Bd^5n\log(c+dx)}{(bc-ad)^3}\right)}{1800b^3g^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^6,x]
```

```
[Out] (i^2*((-360*A*b^2*c^2)/(a + b*x)^5 + (720*a*A*b*c*d)/(a + b*x)^5 - (360*a^2
*A*d^2)/(a + b*x)^5 - (72*b^2*B*c^2*n)/(a + b*x)^5 + (144*a*b*B*c*d*n)/(a +
 b*x)^5 - (72*a^2*B*d^2*n)/(a + b*x)^5 - (900*A*b*c*d)/(a + b*x)^4 + (900*a
*A*d^2)/(a + b*x)^4 - (135*b*B*c*d*n)/(a + b*x)^4 + (135*a*B*d^2*n)/(a + b*
x)^4 - (600*A*d^2)/(a + b*x)^3 - (20*B*d^2*n)/(a + b*x)^3 + (30*B*d^3*n)/((
b*c - a*d)*(a + b*x)^2) - (60*B*d^4*n)/((b*c - a*d)^2*(a + b*x)) - (60*B*d^
5*n*Log[a + b*x])/(b*c - a*d)^3 - (60*B*(a^2*d^2 + a*b*d*(3*c + 5*d*x) + b^
2*(6*c^2 + 15*c*d*x + 10*d^2*x^2))*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x
)^5 + (60*B*d^5*n*Log[c + d*x])/(b*c - a*d)^3))/(1800*b^3*g^6)
```

Maple [**F**]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x)
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 3034 vs. $2(266) = 532$.
time = 0.50, size = 3034, normalized size = 10.35

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x, a
lgorithm="maxima")
```

```
[Out] 1/300*B*c^2*n*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*
c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3
+ 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d
 - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*
b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*
(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^
```

```
5*d^4)*g^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*
a^5*b^5*c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d +
6*a^5*b^5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4
 - 4*a^5*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6
*x + (a^5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 +
 a^9*b*d^4)*g^6) + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b
^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^
5*log(d*x + c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*
c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6)) + 1/1800*B*d^2*n*((47*a^2*b^4*
c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^
4 + 60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*
d - 95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c
^4 - 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2
*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278
*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*
c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^
10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*
(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6
*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 -
 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d
+ 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 -
 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6)
+ 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*
b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5
*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/(
(b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*
b^4*c*d^4 - a^5*b^3*d^5)*g^6)) + 1/600*B*c*d*n*((27*a*b^4*c^4 - 148*a^2*b^3
*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d
^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x
^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d
^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^
2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2
- 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d
+ 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*
c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*
g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5
*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^
5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5
*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*
c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2
- 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4
- a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a
^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) + 1/10*(5*b*x + a)*B*
c*d*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 +
 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) +
```

```
 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*B*d^2*log((b*x/(d*x + c) + a/(d*x + c))^
n*e)/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x
^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + 1/10*(5*b*x + a)*A*c*d/(b^7*g^6*x^5 +
 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*
x + a^5*b^2*g^6) + 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*A*d^2/(b^8*g^6*x^5 + 5
*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x
+ a^5*b^3*g^6) + 1/5*B*c^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^6*g^6*
x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2
*g^6*x + a^5*b*g^6) + 1/5*A*c^2/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4
*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 894 vs. $2(266) = 532$.
time = 0.41, size = 894, normalized size = 3.05

$$\frac{360\,(A+B)b^5c^5 - 900\,(A+B)ab^4c^4d + 600\,(A+B)a^2b^3c^3d^2 - 60\,(A+B)a^5d^5 + 60\,(Bb^5cd^4 - Bab^4d^5)nx^4 - 30\,(Bb^5c^2d^3 - 10\,Bab^4cd^4 + 9\,Ba^2b^3d^5)nx^3 + 10\,(60\,(A+B)b^5c^3d^2 - 180\,(A+B)ab^4c^2d^3 + 180\,(A+B)a^2b^3cd^4 - 60\,(A+B)a^3b^2d^5 + (2\,Bb^5c^3d^2 - 15\,Bab^4c^2d^3 + 60\,Ba^2b^3cd^4 - 47\,Ba^3b^2d^5)n)x^2 + (72\,Bb^5c^5 - 225\,Bab^4c^4d + 200\,Ba^2b^3c^3d^2 - 47\,Ba^5d^5)n + 5\,(180\,(A+B)b^5c^4d - 480\,(A+B)ab^4c^3d^2 + 360\,(A+B)a^2b^3c^2d^3 - 60\,(A+B)a^4bd^5 + (27\,Bb^5c^4d - 100\,Bab^4c^3d^2 + 120\,Ba^2b^3c^2d^3 - 47\,Ba^4bd^5)n)x + 60\,(Bb^5d^5nx^5 + 5\,Bab^4d^5nx^4 + 10\,Ba^2b^3d^5nx^3 + 10\,(Bb^5c^3d^2 - 3\,Bab^4c^2d^3 + 3\,Ba^2b^3cd^4)nx^2 + 5\,(3\,Bb^5c^4d - 8\,Bab^4c^3d^2 + 6\,Ba^2b^3c^2d^3)nx + (6\,Bb^5c^5 - 15\,Bab^4c^4d + 10\,Ba^2b^3c^3d^2)n)\log\left(\frac{bx+a}{dx+c}\right)}{1800\,((b^{11}c^3 - 3\,ab^{10}c^2d + 3\,a^2b^9cd^2 - a^3b^8d^3)g^6x^5 + 5\,(ab^{10}c^3 - 3\,a^2b^9c^2d + 3\,a^3b^8cd^2 - a^4b^7d^3)g^6x^4 + 10\,(a^2b^9c^3 - 3\,a^3b^8c^2d + 3\,a^4b^7cd^2 - a^5b^6d^3)g^6x^3 + 10\,(a^3b^8c^3 - 3\,a^4b^7c^2d + 3\,a^5b^6cd^2 - a^6b^5d^3)g^6x^2 + 5\,(a^4b^7c^3 - 3\,a^5b^6c^2d + 3\,a^6b^5cd^2 - a^7b^4d^3)g^6x + (a^5b^6c^3 - 3\,a^6b^5c^2d + 3\,a^7b^4cd^2 - a^8b^3d^3)g^6)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x, a
lgorithm="fricas")
```

```
[Out] 1/1800*(360*(A + B)*b^5*c^5 - 900*(A + B)*a*b^4*c^4*d + 600*(A + B)*a^2*b^3
*c^3*d^2 - 60*(A + B)*a^5*d^5 + 60*(B*b^5*c*d^4 - B*a*b^4*d^5)*n*x^4 - 30*(
B*b^5*c^2*d^3 - 10*B*a*b^4*c*d^4 + 9*B*a^2*b^3*d^5)*n*x^3 + 10*(60*(A + B)*
b^5*c^3*d^2 - 180*(A + B)*a*b^4*c^2*d^3 + 180*(A + B)*a^2*b^3*c*d^4 - 60*(A
 + B)*a^3*b^2*d^5 + (2*B*b^5*c^3*d^2 - 15*B*a*b^4*c^2*d^3 + 60*B*a^2*b^3*c*
d^4 - 47*B*a^3*b^2*d^5)*n)*x^2 + (72*B*b^5*c^5 - 225*B*a*b^4*c^4*d + 200*B*
a^2*b^3*c^3*d^2 - 47*B*a^5*d^5)*n + 5*(180*(A + B)*b^5*c^4*d - 480*(A + B)*
a*b^4*c^3*d^2 + 360*(A + B)*a^2*b^3*c^2*d^3 - 60*(A + B)*a^4*b*d^5 + (27*B*
b^5*c^4*d - 100*B*a*b^4*c^3*d^2 + 120*B*a^2*b^3*c^2*d^3 - 47*B*a^4*b*d^5)*n
)*x + 60*(B*b^5*d^5*n*x^5 + 5*B*a*b^4*d^5*n*x^4 + 10*B*a^2*b^3*d^5*n*x^3 +
10*(B*b^5*c^3*d^2 - 3*B*a*b^4*c^2*d^3 + 3*B*a^2*b^3*c*d^4)*n*x^2 + 5*(3*B*b
^5*c^4*d - 8*B*a*b^4*c^3*d^2 + 6*B*a^2*b^3*c^2*d^3)*n*x + (6*B*b^5*c^5 - 15
*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2)*n)*log((b*x + a)/(d*x + c)))/((b^11*
c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5*(a*b^10*c
^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 10*(a^2*b^9
*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 + 10*(a^3*b
^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2 + 5*(a^4*
b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x + (a^5*b^6
*c^3 - 3*a^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*g^6)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

Giac [A]
time = 8.14, size = 376, normalized size = 1.28

$$\frac{1}{1800}\left(\frac{60\left(6\,Bb^{2}n-\frac{15\,(bx+a)Bbdn}{dx+c}+\frac{10\,(bx+a)^{2}Bd^{2}n}{(dx+c)^{2}}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^{5}b^{2}c^{2}g^{6}}{(dx+c)^{5}}-\frac{2\,(bx+a)^{5}abcdg^{6}}{(dx+c)^{5}}+\frac{(bx+a)^{5}a^{2}d^{2}g^{6}}{(dx+c)^{5}}}+\frac{72\,Bb^{2}n-\frac{225\,(bx+a)Bbdn}{dx+c}+\frac{200\,(bx+a)^{2}Bd^{2}n}{(dx+c)^{2}}+360\,Ab^{2}+360\,Bb^{2}-\frac{900\,(bx+a)Abd}{dx+c}-\frac{900\,(bx+a)Bbd}{dx+c}+\frac{600\,(bx+a)^{2}Ad^{2}}{(dx+c)^{2}}+\frac{600\,(bx+a)^{2}Bd^{2}}{(dx+c)^{2}}}{\frac{(bx+a)^{5}b^{2}c^{2}g^{6}}{(dx+c)^{5}}-\frac{2\,(bx+a)^{5}abcdg^{6}}{(dx+c)^{5}}+\frac{(bx+a)^{5}a^{2}d^{2}g^{6}}{(dx+c)^{5}}}\right)\left(\frac{bc}{(bc-ad)^{2}}-\frac{ad}{(bc-ad)^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x, a
lgorithm="giac")
```

```
[Out] 1/1800*(60*(6*B*b^2*n - 15*(b*x + a)*B*b*d*n/(d*x + c) + 10*(b*x + a)^2*B*d
^2*n/(d*x + c)^2)*log((b*x + a)/(d*x + c))/((b*x + a)^5*b^2*c^2*g^6/(d*x +
c)^5 - 2*(b*x + a)^5*a*b*c*d*g^6/(d*x + c)^5 + (b*x + a)^5*a^2*d^2*g^6/(d*x
 + c)^5) + (72*B*b^2*n - 225*(b*x + a)*B*b*d*n/(d*x + c) + 200*(b*x + a)^2*
B*d^2*n/(d*x + c)^2 + 360*A*b^2 + 360*B*b^2 - 900*(b*x + a)*A*b*d/(d*x + c)
 - 900*(b*x + a)*B*b*d/(d*x + c) + 600*(b*x + a)^2*A*d^2/(d*x + c)^2 + 600*
(b*x + a)^2*B*d^2/(d*x + c)^2)/((b*x + a)^5*b^2*c^2*g^6/(d*x + c)^5 - 2*(b*
x + a)^5*a*b*c*d*g^6/(d*x + c)^5 + (b*x + a)^5*a^2*d^2*g^6/(d*x + c)^5))*(b
*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 6.71, size = 954, normalized size = 3.26

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
6,x)
```

```
[Out] (B*d^5*i^2*n*atanh((30*b^6*c^3*g^6 + 30*a^3*b^3*d^3*g^6 - 30*a*b^5*c^2*d*g^
6 - 30*a^2*b^4*c*d^2*g^6)/(30*b^3*g^6*(a*d - b*c)^3) + (2*b*d*x*(a^2*d^2 +
b^2*c^2 - 2*a*b*c*d))/(a*d - b*c)^3))/(15*b^3*g^6*(a*d - b*c)^3) - (log(e*(
(a + b*x)/(c + d*x))^n)*(a*((B*a*d^2*i^2)/(30*b^3) + (B*c*d*i^2)/(10*b^2))
+ x*(b*((B*a*d^2*i^2)/(30*b^3) + (B*c*d*i^2)/(10*b^2)) + (2*B*a*d^2*i^2)/(1
5*b^2) + (2*B*c*d*i^2)/(5*b)) + (B*c^2*i^2)/(5*b) + (B*d^2*i^2*x^2)/(3*b)))
/(a^5*g^6 + b^5*g^6*x^5 + 5*a*b^4*g^6*x^4 + 10*a^3*b^2*g^6*x^2 + 10*a^2*b^3
*g^6*x^3 + 5*a^4*b*g^6*x) - ((60*A*a^4*d^4*i^2 + 360*A*b^4*c^4*i^2 + 47*B*a
^4*d^4*i^2*n + 72*B*b^4*c^4*i^2*n + 60*A*a^2*b^2*c^2*d^2*i^2 - 540*A*a*b^3*
c^3*d*i^2 + 60*A*a^3*b*c*d^3*i^2 - 153*B*a*b^3*c^3*d*i^2*n + 47*B*a^3*b*c*d
^3*i^2*n + 47*B*a^2*b^2*c^2*d^2*i^2*n)/(60*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))
 + (x^2*(60*A*a^2*b^2*d^4*i^2 + 60*A*b^4*c^2*d^2*i^2 + 47*B*a^2*b^2*d^4*i^2
*n + 2*B*b^4*c^2*d^2*i^2*n - 120*A*a*b^3*c*d^3*i^2 - 13*B*a*b^3*c*d^3*i^2*n
))/(6*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (x*(60*A*a^3*b*d^4*i^2 + 180*A*b^4
```

```
*c^3*d*i^2 - 300*A*a*b^3*c^2*d^2*i^2 + 60*A*a^2*b^2*c*d^3*i^2 + 47*B*a^3*b*
d^4*i^2*n + 27*B*b^4*c^3*d*i^2*n - 73*B*a*b^3*c^2*d^2*i^2*n + 47*B*a^2*b^2*
c*d^3*i^2*n))/(12*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (d*x^3*(9*B*a*b^3*d^3*
i^2*n - B*b^4*c*d^2*i^2*n))/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (B*b^4*d^
4*i^2*n*x^4)/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))/(30*a^5*b^3*g^6 + 30*b^8*g^6*
x^5 + 150*a^4*b^4*g^6*x + 150*a*b^7*g^6*x^4 + 300*a^3*b^5*g^6*x^2 + 300*a^2
*b^6*g^6*x^3)
```

3.127 $\int (ag+bgx)^3(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=477

$$\frac{B(bc-ad)^6g^3i^3nx}{140b^3d^3}+\frac{B(bc-ad)^5g^3i^3n(c+dx)^2}{280b^2d^4}+\frac{B(bc-ad)^4g^3i^3n(c+dx)^3}{420bd^4}-\frac{17B(bc-ad)^3g^3i^3n(c+dx)}{280d^4}$$

```
[Out] 1/140*B*(-a*d+b*c)^6*g^3*i^3*n*x/b^3/d^3+1/280*B*(-a*d+b*c)^5*g^3*i^3*n*(d*
x+c)^2/b^2/d^4+1/420*B*(-a*d+b*c)^4*g^3*i^3*n*(d*x+c)^3/b/d^4-17/280*B*(-a*
d+b*c)^3*g^3*i^3*n*(d*x+c)^4/d^4+1/14*b*B*(-a*d+b*c)^2*g^3*i^3*n*(d*x+c)^5/
d^4-1/42*b^2*B*(-a*d+b*c)*g^3*i^3*n*(d*x+c)^6/d^4-1/4*(-a*d+b*c)^3*g^3*i^3*
(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^4+3/5*b*(-a*d+b*c)^2*g^3*i^3*(d
*x+c)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^4-1/2*b^2*(-a*d+b*c)*g^3*i^3*(d*x
+c)^6*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^4+1/7*b^3*g^3*i^3*(d*x+c)^7*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))/d^4+1/140*B*(-a*d+b*c)^7*g^3*i^3*n*ln((b*x+a)/(d*x
+c))/b^4/d^4+1/140*B*(-a*d+b*c)^7*g^3*i^3*n*ln(d*x+c)/b^4/d^4
```

Rubi [A]

time = 0.31, antiderivative size = 477, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.116$, Rules used = {2561, 45, 2382, 12, 1634}

$$\frac{b^3g^3i^3(c+dx)^7\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{7d^4}-\frac{b^2g^3i^3(c+dx)^6(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d^4}-\frac{g^3i^3(c+dx)^4(bc-ad)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^4}+\frac{3bg^3i^3(c+dx)^5(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d^4}+\frac{Bg^3i^3n(bc-ad)^7\log\left(\frac{a+bx}{c+dx}\right)}{140b^4d^4}+\frac{Bg^3i^3n(bc-ad)^7\log(c+dx)}{140b^4d^4}+\frac{Bg^3i^3nx(bc-ad)^6}{140b^3d^3}+\frac{Bg^3i^3n(c+dx)^2(bc-ad)^5}{280b^2d^4}-\frac{b^2Bg^3i^3n(c+dx)^6(bc-ad)}{42d^4}+\frac{Bg^3i^3n(c+dx)^3(bc-ad)^4}{420bd^4}-\frac{17Bg^3i^3n(c+dx)^4(bc-ad)^3}{280d^4}+\frac{bBg^3i^3n(c+dx)^5(bc-ad)^2}{14d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),
x]
```

```
[Out] (B*(b*c - a*d)^6*g^3*i^3*n*x)/(140*b^3*d^3) + (B*(b*c - a*d)^5*g^3*i^3*n*(c
 + d*x)^2)/(280*b^2*d^4) + (B*(b*c - a*d)^4*g^3*i^3*n*(c + d*x)^3)/(420*b*d
^4) - (17*B*(b*c - a*d)^3*g^3*i^3*n*(c + d*x)^4)/(280*d^4) + (b*B*(b*c - a*
d)^2*g^3*i^3*n*(c + d*x)^5)/(14*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*n*(c + d*
x)^6)/(42*d^4) - ((b*c - a*d)^3*g^3*i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/(4*d^4) + (3*b*(b*c - a*d)^2*g^3*i^3*(c + d*x)^5*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/(5*d^4) - (b^2*(b*c - a*d)*g^3*i^3*(c + d*x)
^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^4) + (b^3*g^3*i^3*(c + d*x)
^7*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(7*d^4) + (B*(b*c - a*d)^7*g^3*i
^3*n*Log[(a + b*x)/(c + d*x)])/(140*b^4*d^4) + (B*(b*c - a*d)^7*g^3*i^3*n*L
og[c + d*x])/(140*b^4*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (127c+127dx)^3(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx=\int\left(\frac{(-bc+ad)^3g^3(127c+127dx)^3\left(A+\right.}{d^3}\right.$$

$$=\frac{(b^3g^3)\int(127c+127dx)^6\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{2048383d^3}$$

$$=-\frac{2048383(bc-ad)^3g^3(c+dx)^4\left(A+B\,\mathrm{l}\right.}{4d^4}$$

$$=-\frac{2048383(bc-ad)^3g^3(c+dx)^4\left(A+B\,\mathrm{l}\right.}{4d^4}$$

$$=-\frac{2048383(bc-ad)^3g^3(c+dx)^4\left(A+B\,\mathrm{l}\right.}{4d^4}$$

$$=\frac{2048383B(bc-ad)^6g^3nx}{140b^3d^3}+\frac{2048383B(b}{}$$

Mathematica [A]
time = 0.40, size = 631, normalized size = 1.32

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]),x]
```

```
[Out] (g^3*i^3*(210*d^4*(b*c - a*d)^3*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 504*d^5*(b*c - a*d)^2*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 420*d^6*(b*c - a*d)*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]) + 120*d^7*(a + b*x)^7*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 35*B*(
b*c - a*d)^4*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 +
2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 42*B*(b*c - a*d)^3*n*(1
2*b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)
*(a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) - 7*B*(b*
c - a*d)^2*n*(60*b*d*(b*c - a*d)^4*x + 30*d^2*(-(b*c) + a*d)^3*(a + b*x)^2
+ 20*d^3*(b*c - a*d)^2*(a + b*x)^3 + 15*d^4*(-(b*c) + a*d)*(a + b*x)^4 + 12
*d^5*(a + b*x)^5 - 60*(b*c - a*d)^5*Log[c + d*x]) + 2*B*(b*c - a*d)*n*(60*b
*d*(b*c - a*d)^5*x - 30*d^2*(b*c - a*d)^4*(a + b*x)^2 + 20*d^3*(b*c - a*d)^
3*(a + b*x)^3 - 15*d^4*(b*c - a*d)^2*(a + b*x)^4 + 12*d^5*(b*c - a*d)*(a +
b*x)^5 - 10*d^6*(a + b*x)^6 - 60*(b*c - a*d)^6*Log[c + d*x])))/(840*b^4*d^4
)
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^{3} \left(dix+ci\right)^{3} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2780 vs. $2(421) = 842$.
time = 0.34, size = 2780, normalized size = 5.83

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="maxima")
```

[Out] -1/7*I*B*b^3*d^3*g^3*x^7*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/7*I*A*b^3*d^3*g^3*x^7 - 1/2*I*B*b^3*c*d^2*g^3*x^6*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/2*I*B*a*b^2*d^3*g^3*x^6*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/2*I*A*b^3*c*d^2*g^3*x^6 - 1/2*I*A*a*b^2*d^3*g^3*x^6 - 3/5*I*B*b^3*c^2*d*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 9/5*I*B*a*b^2*c*d^2*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/5*I*B*a^2*b*d^3*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/5*I*A*b^3*c^2*d*g^3*x^5 - 9/5*I*A*a*b^2*c*d^2*g^3*x^5 - 3/5*I*A*a^2*b*d^3*g^3*x^5 - 1/4*I*B*b^3*c^3*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 9/4*I*B*a*b^2*c^2*d*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 9/4*I*B*a^2*b*c*d^2*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*I*B*a^3*d^3*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*I*A*b^3*c^3*g^3*x^4 - 9/4*I*A*a*b^2*c^2*d*g^3*x^4 - 9/4*I*A*a^2*b*c*d^2*g^3*x^4 - 1/4*I*A*a^3*d^3*g^3*x^4 - I*B*a*b^2*c^3*g^3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3*I*B*a^2*b*c^2*d*g^3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*B*a^3*c*d^2*g^3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A*a*b^2*c^3*g^3*x^3 - 3*I*A*a^2*b*c^2*d*g^3*x^3 - I*A*a^3*c*d^2*g^3*x^3 - 3/2*I*B*a^2*b*c^3*g^3*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/2*I*B*a^3*c^2*d*g^3*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/2*I*A*a^2*b*c^3*g^3*x^2 - 3/2*I*A*a^3*c^2*d*g^3*x^2 - 1/420*I*B*b^3*d^3*g^3*n*(60*a^7*log(b*x + a)/b^7 - 60*c^7*log(d*x + c)/d^7 - (10*(b^6*c*d^5 - a*b^5*d^6)*x^6 - 12*(b^6*c^2*d^4 - a^2*b^4*d^6)*x^5 + 15*(b^6*c^3*d^3 - a^3*b^3*d^6)*x^4 - 20*(b^6*c^4*d^2 - a^4*b^2*d^6)*x^3 + 30*(b^6*c^5*d - a^5*b*d^6)*x^2 - 60*(b^6*c^6 - a^6*d^6)*x)/(b^6*d^6)) + 1/120*I*B*b^3*c*d^2*g^3*n*(60*a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) + 1/120*I*B*a*b^2*d^3*g^3*n*(60*a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) - 1/20*I*B*b^3*c^2*d*g^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 3/20*I*B*a*b^2*c*d^2*g^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/20*I*B*a^2*b*d^3*g^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) + 1/24*I*B*b^3*c^3*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 3/8*I*B*a*b^2*c^2*d*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 3/8*I*B*a^2*b*c*d^2*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2

```
+ 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/24*I*B*a^3*d^3*g^3*n*(6*a^4*log(b
*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(
b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/2*I*B*
a*b^2*c^3*g^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*
d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3/2*I*B*a^2*b*c^2*
d*g^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*
d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 1/2*I*B*a^3*c*d^2*g^3*n*(2
*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 -
 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 3/2*I*B*a^2*b*c^3*g^3*n*(a^2*log(b*x
 + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 3/2*I*B*a^3*c^2*d
*g^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))
- I*B*a^3*c^3*g^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) - I*B*a^3*c^3*g^3
*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A*a^3*c^3*g^3*x
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1118 vs. 2(421) = 842.
time = 0.68, size = 1118, normalized size = 2.34

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="fricas")
```

```
[Out] -1/840*(120*(I*A + I*B)*b^7*d^7*g^3*x^7 + 20*((-I*B*b^7*c*d^6 + I*B*a*b^6*d
^7)*g^3*n + 21*((I*A + I*B)*b^7*c*d^6 + (I*A + I*B)*a*b^6*d^7)*g^3)*x^6 + 1
2*(5*(-I*B*b^7*c^2*d^5 + I*B*a^2*b^5*d^7)*g^3*n + 42*((I*A + I*B)*b^7*c^2*d
^5 + 3*(I*A + I*B)*a*b^6*c*d^6 + (I*A + I*B)*a^2*b^5*d^7)*g^3)*x^5 + 6*(35*
I*B*a^4*b^3*c^3*d^4 - 21*I*B*a^5*b^2*c^2*d^5 + 7*I*B*a^6*b*c*d^6 - I*B*a^7*
d^7)*g^3*n*log((b*x + a)/b) + 6*(I*B*b^7*c^7 - 7*I*B*a*b^6*c^6*d + 21*I*B*a
^2*b^5*c^5*d^2 - 35*I*B*a^3*b^4*c^4*d^3)*g^3*n*log((d*x + c)/d) + 3*((-17*I
*B*b^7*c^3*d^4 - 49*I*B*a*b^6*c^2*d^5 + 49*I*B*a^2*b^5*c*d^6 + 17*I*B*a^3*b
^4*d^7)*g^3*n + 70*((I*A + I*B)*b^7*c^3*d^4 + 9*(I*A + I*B)*a*b^6*c^2*d^5 +
 9*(I*A + I*B)*a^2*b^5*c*d^6 + (I*A + I*B)*a^3*b^4*d^7)*g^3)*x^4 + 2*((-I*B
*b^7*c^4*d^3 - 98*I*B*a*b^6*c^3*d^4 + 98*I*B*a^3*b^4*c*d^6 + I*B*a^4*b^3*d^
7)*g^3*n + 420*((I*A + I*B)*a*b^6*c^3*d^4 + 3*(I*A + I*B)*a^2*b^5*c^2*d^5 +
 (I*A + I*B)*a^3*b^4*c*d^6)*g^3)*x^3 + 3*((I*B*b^7*c^5*d^2 - 7*I*B*a*b^6*c^
4*d^3 - 84*I*B*a^2*b^5*c^3*d^4 + 84*I*B*a^3*b^4*c^2*d^5 + 7*I*B*a^4*b^3*c*d
^6 - I*B*a^5*b^2*d^7)*g^3*n + 420*((I*A + I*B)*a^2*b^5*c^3*d^4 + (I*A + I*B
)*a^3*b^4*c^2*d^5)*g^3)*x^2 + 6*(140*(I*A + I*B)*a^3*b^4*c^3*d^4*g^3 + (-I*
B*b^7*c^6*d + 7*I*B*a*b^6*c^5*d^2 - 21*I*B*a^2*b^5*c^4*d^3 + 21*I*B*a^4*b^3
*c^2*d^5 - 7*I*B*a^5*b^2*c*d^6 + I*B*a^6*b*d^7)*g^3*n)*x + 6*(20*I*B*b^7*d^
7*g^3*n*x^7 + 140*I*B*a^3*b^4*c^3*d^4*g^3*n*x + 70*(I*B*b^7*c*d^6 + I*B*a*b
^6*d^7)*g^3*n*x^6 + 84*(I*B*b^7*c^2*d^5 + 3*I*B*a*b^6*c*d^6 + I*B*a^2*b^5*d
^7)*g^3*n*x^5 + 35*(I*B*b^7*c^3*d^4 + 9*I*B*a*b^6*c^2*d^5 + 9*I*B*a^2*b^5*c
```

```
*d^6 + I*B*a^3*b^4*d^7)*g^3*n*x^4 + 140*(I*B*a*b^6*c^3*d^4 + 3*I*B*a^2*b^5*
c^2*d^5 + I*B*a^3*b^4*c*d^6)*g^3*n*x^3 + 210*(I*B*a^2*b^5*c^3*d^4 + I*B*a^3
*b^4*c^2*d^5)*g^3*n*x^2)*log((b*x + a)/(d*x + c)))/(b^4*d^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5436 vs. $2(421) = 842$.
time = 5.81, size = 5436, normalized size = 11.40

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="giac")
```

```
[Out] 1/840*(6*(I*B*b^11*c^8*g^3*n - 8*I*B*a*b^10*c^7*d*g^3*n - 7*(I*b*x + I*a)*B
*b^10*c^8*d*g^3*n/(d*x + c) + 28*I*B*a^2*b^9*c^6*d^2*g^3*n - 56*(-I*b*x - I
*a)*B*a*b^9*c^7*d^2*g^3*n/(d*x + c) + 21*I*(b*x + a)^2*B*b^9*c^8*d^2*g^3*n/
(d*x + c)^2 - 56*I*B*a^3*b^8*c^5*d^3*g^3*n - 196*(I*b*x + I*a)*B*a^2*b^8*c^
6*d^3*g^3*n/(d*x + c) - 168*I*(b*x + a)^2*B*a*b^8*c^7*d^3*g^3*n/(d*x + c)^2
 - 35*I*(b*x + a)^3*B*b^8*c^8*d^3*g^3*n/(d*x + c)^3 + 70*I*B*a^4*b^7*c^4*d^
4*g^3*n - 392*(-I*b*x - I*a)*B*a^3*b^7*c^5*d^4*g^3*n/(d*x + c) + 588*I*(b*x
 + a)^2*B*a^2*b^7*c^6*d^4*g^3*n/(d*x + c)^2 + 280*I*(b*x + a)^3*B*a*b^7*c^7
*d^4*g^3*n/(d*x + c)^3 - 56*I*B*a^5*b^6*c^3*d^5*g^3*n - 490*(I*b*x + I*a)*B
*a^4*b^6*c^4*d^5*g^3*n/(d*x + c) - 1176*I*(b*x + a)^2*B*a^3*b^6*c^5*d^5*g^3
*n/(d*x + c)^2 - 980*I*(b*x + a)^3*B*a^2*b^6*c^6*d^5*g^3*n/(d*x + c)^3 + 28
*I*B*a^6*b^5*c^2*d^6*g^3*n - 392*(-I*b*x - I*a)*B*a^5*b^5*c^3*d^6*g^3*n/(d*
x + c) + 1470*I*(b*x + a)^2*B*a^4*b^5*c^4*d^6*g^3*n/(d*x + c)^2 + 1960*I*(b
*x + a)^3*B*a^3*b^5*c^5*d^6*g^3*n/(d*x + c)^3 - 8*I*B*a^7*b^4*c*d^7*g^3*n -
 196*(I*b*x + I*a)*B*a^6*b^4*c^2*d^7*g^3*n/(d*x + c) - 1176*I*(b*x + a)^2*B
*a^5*b^4*c^3*d^7*g^3*n/(d*x + c)^2 - 2450*I*(b*x + a)^3*B*a^4*b^4*c^4*d^7*g
^3*n/(d*x + c)^3 + I*B*a^8*b^3*d^8*g^3*n - 56*(-I*b*x - I*a)*B*a^7*b^3*c*d^
8*g^3*n/(d*x + c) + 588*I*(b*x + a)^2*B*a^6*b^3*c^2*d^8*g^3*n/(d*x + c)^2 +
 1960*I*(b*x + a)^3*B*a^5*b^3*c^3*d^8*g^3*n/(d*x + c)^3 - 7*(I*b*x + I*a)*B
*a^8*b^2*d^9*g^3*n/(d*x + c) - 168*I*(b*x + a)^2*B*a^7*b^2*c*d^9*g^3*n/(d*x
 + c)^2 - 980*I*(b*x + a)^3*B*a^6*b^2*c^2*d^9*g^3*n/(d*x + c)^3 + 21*I*(b*x
 + a)^2*B*a^8*b*d^10*g^3*n/(d*x + c)^2 + 280*I*(b*x + a)^3*B*a^7*b*c*d^10*g
```

```
^3*n/(d*x + c)^3 - 35*I*(b*x + a)^3*B*a^8*d^11*g^3*n/(d*x + c)^3)*log((b*x
+ a)/(d*x + c))/(b^7*d^4 - 7*(b*x + a)*b^6*d^5/(d*x + c) + 21*(b*x + a)^2*b
^5*d^6/(d*x + c)^2 - 35*(b*x + a)^3*b^4*d^7/(d*x + c)^3 + 35*(b*x + a)^4*b^
3*d^8/(d*x + c)^4 - 21*(b*x + a)^5*b^2*d^9/(d*x + c)^5 + 7*(b*x + a)^6*b*d^
10/(d*x + c)^6 - (b*x + a)^7*d^11/(d*x + c)^7) + (6*(I*b*x + I*a)*B*b^13*c^
8*d*g^3*n/(d*x + c) + 48*(-I*b*x - I*a)*B*a*b^12*c^7*d^2*g^3*n/(d*x + c) -
39*I*(b*x + a)^2*B*b^12*c^8*d^2*g^3*n/(d*x + c)^2 + 168*(I*b*x + I*a)*B*a^2
*b^11*c^6*d^3*g^3*n/(d*x + c) + 312*I*(b*x + a)^2*B*a*b^11*c^7*d^3*g^3*n/(d
*x + c)^2 + 107*I*(b*x + a)^3*B*b^11*c^8*d^3*g^3*n/(d*x + c)^3 + 336*(-I*b*
x - I*a)*B*a^3*b^10*c^5*d^4*g^3*n/(d*x + c) - 1092*I*(b*x + a)^2*B*a^2*b^10
*c^6*d^4*g^3*n/(d*x + c)^2 - 856*I*(b*x + a)^3*B*a*b^10*c^7*d^4*g^3*n/(d*x
+ c)^3 - 107*I*(b*x + a)^4*B*b^10*c^8*d^4*g^3*n/(d*x + c)^4 + 420*(I*b*x +
I*a)*B*a^4*b^9*c^4*d^5*g^3*n/(d*x + c) + 2184*I*(b*x + a)^2*B*a^3*b^9*c^5*d
^5*g^3*n/(d*x + c)^2 + 2996*I*(b*x + a)^3*B*a^2*b^9*c^6*d^5*g^3*n/(d*x + c)
^3 + 856*I*(b*x + a)^4*B*a*b^9*c^7*d^5*g^3*n/(d*x + c)^4 + 39*I*(b*x + a)^5
*B*b^9*c^8*d^5*g^3*n/(d*x + c)^5 + 336*(-I*b*x - I*a)*B*a^5*b^8*c^3*d^6*g^3
*n/(d*x + c) - 2730*I*(b*x + a)^2*B*a^4*b^8*c^4*d^6*g^3*n/(d*x + c)^2 - 599
2*I*(b*x + a)^3*B*a^3*b^8*c^5*d^6*g^3*n/(d*x + c)^3 - 2996*I*(b*x + a)^4*B*
a^2*b^8*c^6*d^6*g^3*n/(d*x + c)^4 - 312*I*(b*x + a)^5*B*a*b^8*c^7*d^6*g^3*n
/(d*x + c)^5 - 6*I*(b*x + a)^6*B*b^8*c^8*d^6*g^3*n/(d*x + c)^6 + 168*(I*b*x
 + I*a)*B*a^6*b^7*c^2*d^7*g^3*n/(d*x + c) + 2184*I*(b*x + a)^2*B*a^5*b^7*c^
3*d^7*g^3*n/(d*x + c)^2 + 7490*I*(b*x + a)^3*B*a^4*b^7*c^4*d^7*g^3*n/(d*x +
 c)^3 + 5992*I*(b*x + a)^4*B*a^3*b^7*c^5*d^7*g^3*n/(d*x + c)^4 + 1092*I*(b*
x + a)^5*B*a^2*b^7*c^6*d^7*g^3*n/(d*x + c)^5 + 48*I*(b*x + a)^6*B*a*b^7*c^7
*d^7*g^3*n/(d*x + c)^6 + 48*(-I*b*x - I*a)*B*a^7*b^6*c*d^8*g^3*n/(d*x + c)
- 1092*I*(b*x + a)^2*B*a^6*b^6*c^2*d^8*g^3*n/(d*x + c)^2 - 5992*I*(b*x + a)
^3*B*a^5*b^6*c^3*d^8*g^3*n/(d*x + c)^3 - 7490*I*(b*x + a)^4*B*a^4*b^6*c^4*d
^8*g^3*n/(d*x + c)^4 - 2184*I*(b*x + a)^5*B*a^3*b^6*c^5*d^8*g^3*n/(d*x + c)
^5 - 168*I*(b*x + a)^6*B*a^2*b^6*c^6*d^8*g^3*n/(d*x + c)^6 + 6*(I*b*x + I*a
)*B*a^8*b^5*d^9*g^3*n/(d*x + c) + 312*I*(b*x + a)^2*B*a^7*b^5*c*d^9*g^3*n/(
d*x + c)^2 + 2996*I*(b*x + a)^3*B*a^6*b^5*c^2*d^9*g^3*n/(d*x + c)^3 + 5992*
I*(b*x + a)^4*B*a^5*b^5*c^3*d^9*g^3*n/(d*x + c)^4 + 2730*I*(b*x + a)^5*B*a^
4*b^5*c^4*d^9*g^3*n/(d*x + c)^5 + 336*I*(b*x + a)^6*B*a^3*b^5*c^5*d^9*g^3*n
/(d*x + c)^6 - 39*I*(b*x + a)^2*B*a^8*b^4*d^10*g^3*n/(d*x + c)^2 - 856*I*(b
*x + a)^3*B*a^7*b^4*c*d^10*g^3*n/(d*x + c)^3 - 2996*I*(b*x + a)^4*B*a^6*b^4
*c^2*d^10*g^3*n/(d*x + c)^4 - 2184*I*(b*x + a)^5*B*a^5*b^4*c^3*d^10*g^3*n/(
d*x + c)^5 - 420*I*(b*x + a)^6*B*a^4*b^4*c^4*d^10*g^3*n/(d*x + c)^6 + 107*I
*(b*x + a)^3*B*a^8*b^3*d^11*g^3*n/(d*x + c)^3 + 856*I*(b*x + a)^4*B*a^7*b^3
*c*d^11*g^3*n/(d*x + c)^4 + 1092*I*(b*x + a)^5*B*a^6*b^3*c^2*d^11*g^3*n/(d*
x + c)^5 + 336*I*(b*x + a)^6*B*a^5*b^3*c^3*d^11*g^3*n/(d*x + c)^6 - 107*I*(
b*x + a)^4*B*a^8*b^2*d^12*g^3*n/(d*x + c)^4 - 312*I*(b*x + a)^5*B*a^7*b^2*c
*d^12*g^3*n/(d*x + c)^5 - 168*I*(b*x + a)^6*B*a^6*b^2*c^2*d^12*g^3*n/(d*x +
 c)^6 + 39*I*(b*x + a)^5*B*a^8*b*d^13*g^3*n/(d*x + c)^5 + 48*I*(b*x + a)^6*
B*a^7*b*c*d^13*g^3*n/(d*x + c)^6 - 6*I*(b*x + a)^6*B*a^8*d^14*g^3*n/(d*x +
c)^6 + 6*I*A*b^14*c^8*g^3 + 6*I*B*b^14*c^8*g^3 ...
```

Mupad [B]
time = 6.56, size = 2500, normalized size = 5.24

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)),
x)
```

```
[Out] x^4*((g^3*i^3*(20*A*a^3*d^3 + 20*A*b^3*c^3 + 3*B*a^3*d^3*n - 3*B*b^3*c^3*n
+ 120*A*a*b^2*c^2*d + 120*A*a^2*b*c*d^2 - 6*B*a*b^2*c^2*d*n + 6*B*a^2*b*c*d
^2*n))/20 + ((140*a*d + 140*b*c)*((((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c +
 B*a*d*n - B*b*c*n))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140)*(140*
a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a
^2*d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^3*i^3))/(560*b*
d) - (a*c*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d*n - B*b*c*n))/7 -
(A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140))/(4*b*d)) + x^3*((g^3*i^3*(4*A
*a^4*d^4 + 4*A*b^4*c^4 + B*a^4*d^4*n - B*b^4*c^4*n + 144*A*a^2*b^2*c^2*d^2
+ 64*A*a*b^3*c^3*d + 64*A*a^3*b*c*d^3 - 8*B*a*b^3*c^3*d*n + 8*B*a^3*b*c*d^3
*n))/(12*b*d) - ((140*a*d + 140*b*c)*((g^3*i^3*(20*A*a^3*d^3 + 20*A*b^3*c^3
 + 3*B*a^3*d^3*n - 3*B*b^3*c^3*n + 120*A*a*b^2*c^2*d + 120*A*a^2*b*c*d^2 -
6*B*a*b^2*c^2*d*n + 6*B*a^2*b*c*d^2*n))/5 + ((140*a*d + 140*b*c)*((((b^2*d^
2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d*n - B*b*c*n))/7 - (A*b^2*d^2*g^3*i^3
*(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(1
2*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d))/2 +
 A*a*b^2*c*d^2*g^3*i^3))/(140*b*d) - (a*c*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*
A*b*c + B*a*d*n - B*b*c*n))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140
))/(b*d)))/(420*b*d) + (a*c*((((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*
d*n - B*b*c*n))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140)*(140*a*d +
 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^
2*n - B*b^2*c^2*n + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^3*i^3))/(3*b*d)) + x
^6*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d*n - B*b*c*n))/42 - (A*b^2
*d^2*g^3*i^3*(140*a*d + 140*b*c))/840) - x^2*(((140*a*d + 140*b*c)*((g^3*i^
3*(4*A*a^4*d^4 + 4*A*b^4*c^4 + B*a^4*d^4*n - B*b^4*c^4*n + 144*A*a^2*b^2*c^
2*d^2 + 64*A*a*b^3*c^3*d + 64*A*a^3*b*c*d^3 - 8*B*a*b^3*c^3*d*n + 8*B*a^3*b
*c*d^3*n))/(4*b*d) - ((140*a*d + 140*b*c)*((g^3*i^3*(20*A*a^3*d^3 + 20*A*b^
3*c^3 + 3*B*a^3*d^3*n - 3*B*b^3*c^3*n + 120*A*a*b^2*c^2*d + 120*A*a^2*b*c*d
^2 - 6*B*a*b^2*c^2*d*n + 6*B*a^2*b*c*d^2*n))/5 + ((140*a*d + 140*b*c)*((((b
^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d*n - B*b*c*n))/7 - (A*b^2*d^2*g^
3*i^3*(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i
^3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d)
)/2 + A*a*b^2*c*d^2*g^3*i^3))/(140*b*d) - (a*c*((b^2*d^2*g^3*i^3*(28*A*a*d
+ 28*A*b*c + B*a*d*n - B*b*c*n))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c)
)/140))/(b*d)))/(140*b*d) + (a*c*((((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c +
 B*a*d*n - B*b*c*n))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140)*(140*
```

a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a
^2*d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^3*i^3))/(b*d)))
/(280*b*d) + (a*c*((g^3*i^3*(20*A*a^3*d^3 + 20*A*b^3*c^3 + 3*B*a^3*d^3*n -
3*B*b^3*c^3*n + 120*A*a*b^2*c^2*d + 120*A*a^2*b*c*d^2 - 6*B*a*b^2*c^2*d*n +
6*B*a^2*b*c*d^2*n))/5 + ((140*a*d + 140*b*c)*((((b^2*d^2*g^3*i^3*(28*A*a*d
+ 28*A*b*c + B*a*d*n - B*b*c*n))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c
))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12*A*
b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^3*
i^3))/(140*b*d) - (a*c*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d*n - B
*b*c*n))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140))/(b*d)))/(2*b*d)
- (a*c*g^3*i^3*(4*A*a^3*d^3 + 4*A*b^3*c^3 + B*a^3*d^3*n - B*b^3*c^3*n + 24*
A*a*b^2*c^2*d + 24*A*a^2*b*c*d^2 - 2*B*a*b^2*c^2*d*n + 2*B*a^2*b*c*d^2*n))/
(2*b*d)) - x^5*((((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d*n - B*b*c*n
))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(7
00*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c
^2*n + 32*A*a*b*c*d))/10 + (A*a*b^2*c*d^2*g^3*i^3)/5) + x*(((140*a*d + 140*
b*c)*(((140*a*d + 140*b*c)*((g^3*i^3*(4*A*a^4*d^4 + 4*A*b^4*c^4 + B*a^4*d^4
*n - B*b^4*c^4*n + 144*A*a^2*b^2*c^2*d^2 + 64*A*a*b^3*c^3*d + 64*A*a^3*b*c*
d^3 - 8*B*a*b^3*c^3*d*n + 8*B*a^3*b*c*d^3*n))/(4*b*d) - ((140*a*d + 140*b*c
)*((g^3*i^3*(20*A*a^3*d^3 + 20*A*b^3*c^3 + 3*B*a^3*d^3*n - 3*B*b^3*c^3*n +
120*A*a*b^2*c^2*d + 120*A*a^2*b*c*d^2 - 6*B*a*b^2*c^2*d*n + 6*B*a^2*b*c*d^2
*n))/5 + ((140*a*d + 140*b*c)*((((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*
a*d*n - B*b*c*n))/7 - (A*b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140)*(140*a*d
+ 140*b*c))/(140*b*d) - (b*d*g^3*i^3*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*
d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d))/2 + A*a*b^2*c*d^2*g^3*i^3))/(140*b*d)
- (a*c*((b^2*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d*n - B*b*c*n))/7 - (A*
b^2*d^2*g^3*i^3*(140*a*d + 140*b*c))/140))/(b*d)))/(140*b*d) + (a*c*((((b^2
*d^2*g^3*i^3*(28*A*a*d + 28*A*b*c + B*a*d*n - B*b*c*n))/7 - (A*b^2*d^2*g^3*
i^3*(140*a*d + 140*b*c))/140)*(140*a*d + 140*b*c))/(140*b*d) - (b*d*g^3*i^3
*(12*A*a^2*d^2 + 12*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 32*A*a*b*c*d))/
2 + A*a*b^2*c*d^2*g^3*i^3))/(b*d)))/(140*b*d) +...

3.128 $\int (ag+bgx)^2(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=387

$$-\frac{B(bc-ad)^5g^2i^3nx}{60b^3d^2}-\frac{B(bc-ad)^4g^2i^3n(c+dx)^2}{120b^2d^3}-\frac{B(bc-ad)^3g^2i^3n(c+dx)^3}{180bd^3}+\frac{7B(bc-ad)^2g^2i^3n(c+dx)^4}{120d^3}$$

```
[Out] -1/60*B*(-a*d+b*c)^5*g^2*i^3*n*x/b^3/d^2-1/120*B*(-a*d+b*c)^4*g^2*i^3*n*(d*
x+c)^2/b^2/d^3-1/180*B*(-a*d+b*c)^3*g^2*i^3*n*(d*x+c)^3/b/d^3+7/120*B*(-a*d
+b*c)^2*g^2*i^3*n*(d*x+c)^4/d^3-1/30*b*B*(-a*d+b*c)*g^2*i^3*n*(d*x+c)^5/d^3
+1/4*(-a*d+b*c)^2*g^2*i^3*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^3-2/5
*b*(-a*d+b*c)*g^2*i^3*(d*x+c)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^3+1/6*b^2
*g^2*i^3*(d*x+c)^6*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^3-1/60*B*(-a*d+b*c)^6*
g^2*i^3*n*ln((b*x+a)/(d*x+c))/b^4/d^3-1/60*B*(-a*d+b*c)^6*g^2*i^3*n*ln(d*x+
c)/b^4/d^3
```

Rubi [A]
time = 0.25, antiderivative size = 387, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.116$, Rules used = {2561, 45, 2382, 12, 907}

$$\frac{b^2g^2i^3(c+dx)^6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6d^3}+\frac{g^2i^3(c+dx)^4(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^3}-\frac{2bg^2i^3(c+dx)^5(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d^3}-\frac{Bg^2i^3n(bc-ad)^6\log\left(\frac{a+bx}{c+dx}\right)}{60b^4d^3}-\frac{Bg^2i^3n(bc-ad)^6\log(c+dx)}{60b^4d^3}-\frac{Bg^2i^3nx(bc-ad)^5}{60b^3d^2}-\frac{Bg^2i^3n(c+dx)^2(bc-ad)^4}{120b^2d^3}-\frac{Bg^2i^3n(c+dx)^3(bc-ad)^3}{180bd^3}+\frac{7Bg^2i^3n(c+dx)^4(bc-ad)^2}{120d^3}-\frac{bBg^2i^3n(c+dx)^5(bc-ad)}{30d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),
x]
```

```
[Out] -1/60*(B*(b*c - a*d)^5*g^2*i^3*n*x)/(b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*n*
(c + d*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*n*(c + d*x)^3)/(180*b
*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*n*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a
*d)*g^2*i^3*n*(c + d*x)^5)/(30*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c
 + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^3) + (b^2*g^2*i^3*(c
 + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d^3) - (B*(b*c - a*d)^
6*g^2*i^3*n*Log[(a + b*x)/(c + d*x)])/(60*b^4*d^3) - (B*(b*c - a*d)^6*g^2*i
^3*n*Log[c + d*x])/(60*b^4*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (128c+128dx)^3(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx = \int\left(\frac{(-bc+ad)^2g^2(128c+128dx)^3\left(A\right.}{d^2}\right.$$

$$= \frac{(b^2g^2)\int(128c+128dx)^5\left(A+B\log\left(e\right.\right.}{16384d^2}$$

$$= \frac{524288(bc-ad)^2g^2(c+dx)^4\left(A+B\log\right.}{d^3}$$

$$= \frac{524288(bc-ad)^2g^2(c+dx)^4\left(A+B\log\right.}{d^3}$$

$$= \frac{524288(bc-ad)^2g^2(c+dx)^4\left(A+B\log\right.}{d^3}$$

$$= -\frac{524288B(bc-ad)^5g^2nx}{15b^3d^2} - \frac{262144B(}{}$$

Mathematica [A]
time = 0.24, size = 441, normalized size = 1.14

$$\frac{g^2i^3\left(-15B(bc-ad)^3n\left(6bd(bc-ad)^2x+3b^2(bc-ad)(c+dx)^2+2b^3(c+dx)^3+6(bc-ad)^3\log(a+bx)\right)+12B(bc-ad)^2n\left(12bd(bc-ad)^3x+6b^2(bc-ad)^2(c+dx)^2+4b^3(bc-ad)(c+dx)^3+3b^4(c+dx)^4+12(bc-ad)^4\log(a+bx)\right)-B(bc-ad)n\left(60bd(bc-ad)^4x+30b^2(bc-ad)^3(c+dx)^2+20b^3(bc-ad)^2(c+dx)^3+15b^4(bc-ad)(c+dx)^4+12b^5(c+dx)^5+60(bc-ad)^5\log(a+bx)\right)+90b^4(bc-ad)^2(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-144b^5(bc-ad)(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+60b^6(c+dx)^6\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\right)}{360b^4d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]),x]
```

```
[Out] (g^2*i^3*(-15*B*(b*c - a*d)^3*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*
(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) + 12*B*(b*c
 - a*d)^2*n*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b
^3*(b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b
*x]) - B*(b*c - a*d)*n*(60*b*d*(b*c - a*d)^4*x + 30*b^2*(b*c - a*d)^3*(c +
d*x)^2 + 20*b^3*(b*c - a*d)^2*(c + d*x)^3 + 15*b^4*(b*c - a*d)*(c + d*x)^4
+ 12*b^5*(c + d*x)^5 + 60*(b*c - a*d)^5*Log[a + b*x]) + 90*b^4*(b*c - a*d)^
2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 144*b^5*(b*c - a*d)*
(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 60*b^6*(c + d*x)^6*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n])))/(360*b^4*d^3)
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^{2} \left(dix+ci\right)^{3} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1890 vs. 2(340) = 680.
time = 0.32, size = 1890, normalized size = 4.88

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="maxima")
```

```
[Out] -1/6*I*B*b^2*d^3*g^2*x^6*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/6*I*A*b
^2*d^3*g^2*x^6 - 3/5*I*B*b^2*c*d^2*g^2*x^5*log((b*x/(d*x + c) + a/(d*x + c)
)^n*e) - 2/5*I*B*a*b*d^3*g^2*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3
/5*I*A*b^2*c*d^2*g^2*x^5 - 2/5*I*A*a*b*d^3*g^2*x^5 - 3/4*I*B*b^2*c^2*d*g^2*
```

```
x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/2*I*B*a*b*c*d^2*g^2*x^4*log(
(b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*I*B*a^2*d^3*g^2*x^4*log((b*x/(d*x
+ c) + a/(d*x + c))^n*e) - 3/4*I*A*b^2*c^2*d*g^2*x^4 - 3/2*I*A*a*b*c*d^2*g^
2*x^4 - 1/4*I*A*a^2*d^3*g^2*x^4 - 1/3*I*B*b^2*c^3*g^2*x^3*log((b*x/(d*x + c
) + a/(d*x + c))^n*e) - 2*I*B*a*b*c^2*d*g^2*x^3*log((b*x/(d*x + c) + a/(d*x
 + c))^n*e) - I*B*a^2*c*d^2*g^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)
- 1/3*I*A*b^2*c^3*g^2*x^3 - 2*I*A*a*b*c^2*d*g^2*x^3 - I*A*a^2*c*d^2*g^2*x^3
 - I*B*a*b*c^3*g^2*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/2*I*B*a^2
*c^2*d*g^2*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A*a*b*c^3*g^2*x^2
 - 3/2*I*A*a^2*c^2*d*g^2*x^2 + 1/360*I*B*b^2*d^3*g^2*n*(60*a^6*log(b*x + a)
/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*
c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c
^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) - 1/20*I*B*b^2
*c*d^2*g^2*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c
*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d -
a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/30*I*B*a*b*d^3*g^
2*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*
b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4
)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) + 1/8*I*B*b^2*c^2*d*g^2*n*(6*a
^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x
^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) +
1/4*I*B*a*b*c*d^2*g^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 +
(2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3
 - a^3*d^3)*x)/(b^3*d^3)) + 1/24*I*B*a^2*d^3*g^2*n*(6*a^4*log(b*x + a)/b^4
- 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d -
a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/6*I*B*b^2*c^3*g^2*
n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x
^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - I*B*a*b*c^2*d*g^2*n*(2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2)) - 1/2*I*B*a^2*c*d^2*g^2*n*(2*a^3*log(b*x + a)/b^
3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^
2)*x)/(b^2*d^2)) + I*B*a*b*c^3*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x +
c)/d^2 + (b*c - a*d)*x/(b*d)) + 3/2*I*B*a^2*c^2*d*g^2*n*(a^2*log(b*x + a)/b
^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - I*B*a^2*c^3*g^2*n*(a*log
(b*x + a)/b - c*log(d*x + c)/d) - I*B*a^2*c^3*g^2*x*log((b*x/(d*x + c) + a/
(d*x + c))^n*e) - I*A*a^2*c^3*g^2*x
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 894 vs. $2(340) = 680$.
time = 0.58, size = 894, normalized size = 2.31

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="fricas")
```

```
[Out] -1/360*(60*(I*A + I*B)*b^6*d^6*g^2*x^6 + 12*((-I*B*b^6*c*d^5 + I*B*a*b^5*d^
6)*g^2*n + 6*(3*(I*A + I*B)*b^6*c*d^5 + 2*(I*A + I*B)*a*b^5*d^6)*g^2)*x^5 +
 3*((-13*I*B*b^6*c^2*d^4 + 6*I*B*a*b^5*c*d^5 + 7*I*B*a^2*b^4*d^6)*g^2*n + 3
0*(3*(I*A + I*B)*b^6*c^2*d^4 + 6*(I*A + I*B)*a*b^5*c*d^5 + (I*A + I*B)*a^2*
b^4*d^6)*g^2)*x^4 + 6*(20*I*B*a^3*b^3*c^3*d^3 - 15*I*B*a^4*b^2*c^2*d^4 + 6*
I*B*a^5*b*c*d^5 - I*B*a^6*d^6)*g^2*n*log((b*x + a)/b) + 6*(-I*B*b^6*c^6 + 6
*I*B*a*b^5*c^5*d - 15*I*B*a^2*b^4*c^4*d^2)*g^2*n*log((d*x + c)/d) + 2*((-19
*I*B*b^6*c^3*d^3 - 21*I*B*a*b^5*c^2*d^4 + 39*I*B*a^2*b^4*c*d^5 + I*B*a^3*b^
3*d^6)*g^2*n + 60*((I*A + I*B)*b^6*c^3*d^3 + 6*(I*A + I*B)*a*b^5*c^2*d^4 +
3*(I*A + I*B)*a^2*b^4*c*d^5)*g^2)*x^3 + 3*((-I*B*b^6*c^4*d^2 - 34*I*B*a*b^5
*c^3*d^3 + 30*I*B*a^2*b^4*c^2*d^4 + 6*I*B*a^3*b^3*c*d^5 - I*B*a^4*b^2*d^6)*
g^2*n + 60*(2*(I*A + I*B)*a*b^5*c^3*d^3 + 3*(I*A + I*B)*a^2*b^4*c^2*d^4)*g^
2)*x^2 + 6*(60*(I*A + I*B)*a^2*b^4*c^3*d^3*g^2 + (I*B*b^6*c^5*d - 6*I*B*a*b
^5*c^4*d^2 - 5*I*B*a^2*b^4*c^3*d^3 + 15*I*B*a^3*b^3*c^2*d^4 - 6*I*B*a^4*b^2
*c*d^5 + I*B*a^5*b*d^6)*g^2*n)*x + 6*(10*I*B*b^6*d^6*g^2*n*x^6 + 60*I*B*a^2
*b^4*c^3*d^3*g^2*n*x + 12*(3*I*B*b^6*c*d^5 + 2*I*B*a*b^5*d^6)*g^2*n*x^5 + 1
5*(3*I*B*b^6*c^2*d^4 + 6*I*B*a*b^5*c*d^5 + I*B*a^2*b^4*d^6)*g^2*n*x^4 + 20*
(I*B*b^6*c^3*d^3 + 6*I*B*a*b^5*c^2*d^4 + 3*I*B*a^2*b^4*c*d^5)*g^2*n*x^3 + 3
0*(2*I*B*a*b^5*c^3*d^3 + 3*I*B*a^2*b^4*c^2*d^4)*g^2*n*x^2)*log((b*x + a)/(d
*x + c)))/(b^4*d^3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3942 vs. $2(340) = 680$.
time = 6.48, size = 3942, normalized size = 10.19

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="giac")
```

```
[Out] -1/360*(6*(I*B*b^9*c^7*g^2*n - 7*I*B*a*b^8*c^6*d*g^2*n - 6*(I*b*x + I*a)*B*
b^8*c^7*d*g^2*n/(d*x + c) + 21*I*B*a^2*b^7*c^5*d^2*g^2*n - 42*(-I*b*x - I*a
)*B*a*b^7*c^6*d^2*g^2*n/(d*x + c) + 15*I*(b*x + a)^2*B*b^7*c^7*d^2*g^2*n/(d
*x + c)^2 - 35*I*B*a^3*b^6*c^4*d^3*g^2*n - 126*(I*b*x + I*a)*B*a^2*b^6*c^5*
d^3*g^2*n/(d*x + c) - 105*I*(b*x + a)^2*B*a*b^6*c^6*d^3*g^2*n/(d*x + c)^2 +
```

35*I*B*a^4*b^5*c^3*d^4*g^2*n - 210*(-I*b*x - I*a)*B*a^3*b^5*c^4*d^4*g^2*n/
(d*x + c) + 315*I*(b*x + a)^2*B*a^2*b^5*c^5*d^4*g^2*n/(d*x + c)^2 - 21*I*B*
a^5*b^4*c^2*d^5*g^2*n - 210*(I*b*x + I*a)*B*a^4*b^4*c^3*d^5*g^2*n/(d*x + c)
- 525*I*(b*x + a)^2*B*a^3*b^4*c^4*d^5*g^2*n/(d*x + c)^2 + 7*I*B*a^6*b^3*c*
d^6*g^2*n - 126*(-I*b*x - I*a)*B*a^5*b^3*c^2*d^6*g^2*n/(d*x + c) + 525*I*(b
*x + a)^2*B*a^4*b^3*c^3*d^6*g^2*n/(d*x + c)^2 - I*B*a^7*b^2*d^7*g^2*n - 42*
(I*b*x + I*a)*B*a^6*b^2*c*d^7*g^2*n/(d*x + c) - 315*I*(b*x + a)^2*B*a^5*b^2
*c^2*d^7*g^2*n/(d*x + c)^2 - 6*(-I*b*x - I*a)*B*a^7*b*d^8*g^2*n/(d*x + c) +
105*I*(b*x + a)^2*B*a^6*b*c*d^8*g^2*n/(d*x + c)^2 - 15*I*(b*x + a)^2*B*a^7
*d^9*g^2*n/(d*x + c)^2)*log((b*x + a)/(d*x + c))/(b^6*d^3 - 6*(b*x + a)*b^5
*d^4/(d*x + c) + 15*(b*x + a)^2*b^4*d^5/(d*x + c)^2 - 20*(b*x + a)^3*b^3*d^
6/(d*x + c)^3 + 15*(b*x + a)^4*b^2*d^7/(d*x + c)^4 - 6*(b*x + a)^5*b*d^8/(d
*x + c)^5 + (b*x + a)^6*d^9/(d*x + c)^6) + (-2*I*B*b^12*c^7*g^2*n + 14*I*B*
a*b^11*c^6*d*g^2*n - 18*(-I*b*x - I*a)*B*b^11*c^7*d*g^2*n/(d*x + c) - 42*I*
B*a^2*b^10*c^5*d^2*g^2*n - 126*(I*b*x + I*a)*B*a*b^10*c^6*d^2*g^2*n/(d*x +
c) - 63*I*(b*x + a)^2*B*b^10*c^7*d^2*g^2*n/(d*x + c)^2 + 70*I*B*a^3*b^9*c^4
*d^3*g^2*n - 378*(-I*b*x - I*a)*B*a^2*b^9*c^5*d^3*g^2*n/(d*x + c) + 441*I*(
b*x + a)^2*B*a*b^9*c^6*d^3*g^2*n/(d*x + c)^2 + 74*I*(b*x + a)^3*B*b^9*c^7*d
^3*g^2*n/(d*x + c)^3 - 70*I*B*a^4*b^8*c^3*d^4*g^2*n - 630*(I*b*x + I*a)*B*a
^3*b^8*c^4*d^4*g^2*n/(d*x + c) - 1323*I*(b*x + a)^2*B*a^2*b^8*c^5*d^4*g^2*n
/(d*x + c)^2 - 518*I*(b*x + a)^3*B*a*b^8*c^6*d^4*g^2*n/(d*x + c)^3 - 33*I*(
b*x + a)^4*B*b^8*c^7*d^4*g^2*n/(d*x + c)^4 + 42*I*B*a^5*b^7*c^2*d^5*g^2*n -
630*(-I*b*x - I*a)*B*a^4*b^7*c^3*d^5*g^2*n/(d*x + c) + 2205*I*(b*x + a)^2*
B*a^3*b^7*c^4*d^5*g^2*n/(d*x + c)^2 + 1554*I*(b*x + a)^3*B*a^2*b^7*c^5*d^5*
g^2*n/(d*x + c)^3 + 231*I*(b*x + a)^4*B*a*b^7*c^6*d^5*g^2*n/(d*x + c)^4 + 6
I(b*x + a)^5*B*b^7*c^7*d^5*g^2*n/(d*x + c)^5 - 14*I*B*a^6*b^6*c*d^6*g^2*n
- 378*(I*b*x + I*a)*B*a^5*b^6*c^2*d^6*g^2*n/(d*x + c) - 2205*I*(b*x + a)^2
*B*a^4*b^6*c^3*d^6*g^2*n/(d*x + c)^2 - 2590*I*(b*x + a)^3*B*a^3*b^6*c^4*d^6
*g^2*n/(d*x + c)^3 - 693*I*(b*x + a)^4*B*a^2*b^6*c^5*d^6*g^2*n/(d*x + c)^4
- 42*I*(b*x + a)^5*B*a*b^6*c^6*d^6*g^2*n/(d*x + c)^5 + 2*I*B*a^7*b^5*d^7*g^
2*n - 126*(-I*b*x - I*a)*B*a^6*b^5*c*d^7*g^2*n/(d*x + c) + 1323*I*(b*x + a)
^2*B*a^5*b^5*c^2*d^7*g^2*n/(d*x + c)^2 + 2590*I*(b*x + a)^3*B*a^4*b^5*c^3*d
^7*g^2*n/(d*x + c)^3 + 1155*I*(b*x + a)^4*B*a^3*b^5*c^4*d^7*g^2*n/(d*x + c)
^4 + 126*I*(b*x + a)^5*B*a^2*b^5*c^5*d^7*g^2*n/(d*x + c)^5 - 18*(I*b*x + I*
a)*B*a^7*b^4*d^8*g^2*n/(d*x + c) - 441*I*(b*x + a)^2*B*a^6*b^4*c*d^8*g^2*n/
(d*x + c)^2 - 1554*I*(b*x + a)^3*B*a^5*b^4*c^2*d^8*g^2*n/(d*x + c)^3 - 1155
I(b*x + a)^4*B*a^4*b^4*c^3*d^8*g^2*n/(d*x + c)^4 - 210*I*(b*x + a)^5*B*a^
3*b^4*c^4*d^8*g^2*n/(d*x + c)^5 + 63*I*(b*x + a)^2*B*a^7*b^3*d^9*g^2*n/(d*x
+ c)^2 + 518*I*(b*x + a)^3*B*a^6*b^3*c*d^9*g^2*n/(d*x + c)^3 + 693*I*(b*x
+ a)^4*B*a^5*b^3*c^2*d^9*g^2*n/(d*x + c)^4 + 210*I*(b*x + a)^5*B*a^4*b^3*c^
3*d^9*g^2*n/(d*x + c)^5 - 74*I*(b*x + a)^3*B*a^7*b^2*d^10*g^2*n/(d*x + c)^3
- 231*I*(b*x + a)^4*B*a^6*b^2*c*d^10*g^2*n/(d*x + c)^4 - 126*I*(b*x + a)^5
*B*a^5*b^2*c^2*d^10*g^2*n/(d*x + c)^5 + 33*I*(b*x + a)^4*B*a^7*b*d^11*g^2*n
/(d*x + c)^4 + 42*I*(b*x + a)^5*B*a^6*b*c*d^11*g^2*n/(d*x + c)^5 - 6*I*(b*x
+ a)^5*B*a^7*d^12*g^2*n/(d*x + c)^5 + 6*I*A*b^12*c^7*g^2 + 6*I*B*b^12*c^7*

```
g^2 - 42*I*A*a*b^11*c^6*d*g^2 - 42*I*B*a*b^11*c^6*d*g^2 - 36*(I*b*x + I*a)*
A*b^11*c^7*d*g^2/(d*x + c) - 36*(I*b*x + I*a)*B*b^11*c^7*d*g^2/(d*x + c) +
126*I*A*a^2*b^10*c^5*d^2*g^2 + 126*I*B*a^2*b^10*c^5*d^2*g^2 - 252*(-I*b*x -
 I*a)*A*a*b^10*c^6*d^2*g^2/(d*x + c) - 252*(-I*b*x - I*a)*B*a*b^10*c^6*d^2*
g^2/(d*x + c) + 90*I*(b*x + a)^2*A*b^10*c^7*d^2*g^2/(d*x + c)^2 + 90*I*(b*x
 + a)^2*B*b^10*c^7*d^2*g^2/(d*x + c)^2 - 210*I*A*a^3*b^9*c^4*d^3*g^2 - 210*
I*B*a^3*b^9*c^4*d^3*g^2 - 756*(I*b*x + I*a)*A*a^2*b^9*c^5*d^3*g^2/(d*x + c)
 - 756*(I*b*x + I*a)*B*a^2*b^9*c^5*d^3*g^2/(d*x + c) - 630*I*(b*x + a)^2*A*
a*b^9*c^6*d^3*g^2/(d*x + c)^2 - 630*I*(b*x + a)^2*B*a*b^9*c^6*d^3*g^2/(d*x
+ c)^2 + 210*I*A*a^4*b^8*c^3*d^4*g^2 + 210*I*B*a^4*b^8*c^3*d^4*g^2 - 1260*(
-I*b*x - I*a)*A*a^3*b^8*c^4*d^4*g^2/(d*x + c) - 1260*(-I*b*x - I*a)*B*a^3*b
^8*c^4*d^4*g^2/(d*x + c) + 1890*I*(b*x + a)^2*A*a^2*b^8*c^5*d^4*g^2/(d*x +
c)^2 + 1890*I*(b*x + a)^2*B*a^2*b^8*c^5*d^4*g^2/(d*x + c)^2 - 126*I*A*a^5*b
^7*c^2*d^5*g^2 - 126*I*B*a^5*b^7*c^2*d^5*g^2 - 1260*(I*b*x + I*a)*A*a^4*b^7
*c^3*d^5*g^2/(d*x + c) - 1260*(I*b*x + I*a)*B*a^4*b^7*c^3*d^5*g^2/(d*x + c)
 - 3150*I*(b*x + a)^2*A*a^3*b^7*c^4*d^5*g^2/(d*x + c)^2 - 3150*I*(b*x + a)^
2*B*a^3*b^7*c^4*d^5*g^2/(d*x + c)^2 + 42*I*A*a^...
```

Mupad [B]
time = 6.26, size = 2547, normalized size = 6.58

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)),
x)
```

```
[Out] x^2*((a*c*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/6 -
(A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (d*g^
2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2*n - 3*B*b^2*c^2*n + 60*A*a
*b*c*d + B*a*b*c*d*n))/5 + A*a*b*c*d^2*g^2*i^3))/(2*b*d) - ((60*a*d + 60*b*
c)*((g^2*i^3*(4*A*a^3*d^3 + 16*A*b^3*c^3 + B*a^3*d^3*n - 3*B*b^3*c^3*n + 72
*A*a*b^2*c^2*d + 48*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d*n + 5*B*a^2*b*c*d^2*n))
/(4*b) + ((60*a*d + 60*b*c)*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*
n - B*b*c*n))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c)
)/(60*b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2*n - 3*B*
b^2*c^2*n + 60*A*a*b*c*d + B*a*b*c*d*n))/5 + A*a*b*c*d^2*g^2*i^3))/(60*b*d)
 - (a*c*((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b
*d^2*g^2*i^3*(60*a*d + 60*b*c))/60))/(b*d)))/(120*b*d) + (c*g^2*i^3*(12*A*a
^3*d^3 + 3*A*b^3*c^3 + 3*B*a^3*d^3*n - B*b^3*c^3*n + 36*A*a*b^2*c^2*d + 54*
A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d*n + 3*B*a^2*b*c*d^2*n))/(6*b*d)) + x^3*((g^
2*i^3*(4*A*a^3*d^3 + 16*A*b^3*c^3 + B*a^3*d^3*n - 3*B*b^3*c^3*n + 72*A*a*b^
2*c^2*d + 48*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d*n + 5*B*a^2*b*c*d^2*n))/(12*b)
 + ((60*a*d + 60*b*c)*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*
b*c*n))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*
```

b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2*n - 3*B*b^2*c^2*n + 60*A*a*b*c*d + B*a*b*c*d*n))/5 + A*a*b*c*d^2*g^2*i^3))/(180*b*d) - (a*c*((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60))/(3*b*d)) - x^4*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(240*b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2*n - 3*B*b^2*c^2*n + 60*A*a*b*c*d + B*a*b*c*d*n))/20 + (A*a*b*c*d^2*g^2*i^3)/4) + x^5*((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/30 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/300) - x*(((60*a*d + 60*b*c)*((a*c*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2*n - 3*B*b^2*c^2*n + 60*A*a*b*c*d + B*a*b*c*d*n))/5 + A*a*b*c*d^2*g^2*i^3))/(b*d) - ((60*a*d + 60*b*c)*((g^2*i^3*(4*A*a^3*d^3 + 16*A*b^3*c^3 + B*a^3*d^3*n - 3*B*b^3*c^3*n + 72*A*a*b^2*c^2*d + 48*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d*n + 5*B*a^2*b*c*d^2*n))/(4*b) + ((60*a*d + 60*b*c)*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2*n - 3*B*b^2*c^2*n + 60*A*a*b*c*d + B*a*b*c*d*n))/5 + A*a*b*c*d^2*g^2*i^3))/(60*b*d) - (a*c*((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60))/(b*d)))/(60*b*d) + (c*g^2*i^3*(12*A*a^3*d^3 + 3*A*b^3*c^3 + 3*B*a^3*d^3*n - B*b^3*c^3*n + 36*A*a*b^2*c^2*d + 54*A*a^2*b*c*d^2 - 5*B*a*b^2*c^2*d*n + 3*B*a^2*b*c*d^2*n))/(3*b*d)))/(60*b*d) + (a*c*((g^2*i^3*(4*A*a^3*d^3 + 16*A*b^3*c^3 + B*a^3*d^3*n - 3*B*b^3*c^3*n + 72*A*a*b^2*c^2*d + 48*A*a^2*b*c*d^2 - 3*B*a*b^2*c^2*d*n + 5*B*a^2*b*c*d^2*n))/(4*b) + ((60*a*d + 60*b*c)*((((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60)*(60*a*d + 60*b*c))/(60*b*d) - (d*g^2*i^3*(15*A*a^2*d^2 + 30*A*b^2*c^2 + 2*B*a^2*d^2*n - 3*B*b^2*c^2*n + 60*A*a*b*c*d + B*a*b*c*d*n))/5 + A*a*b*c*d^2*g^2*i^3))/(60*b*d) - (a*c*((b*d^2*g^2*i^3*(18*A*a*d + 24*A*b*c + B*a*d*n - B*b*c*n))/6 - (A*b*d^2*g^2*i^3*(60*a*d + 60*b*c))/60))/(b*d)))/(b*d) - (a*c^2*g^2*i^3*(12*A*a^2*d^2 + 6*A*b^2*c^2 + 3*B*a^2*d^2*n - 2*B*b^2*c^2*n + 24*A*a*b*c*d - B*a*b*c*d*n))/(2*b*d)) + log(e*((a + b*x)/(c + d*x))^n)*(B*a^2*c^3*g^2*i^3*x + (B*c*g^2*i^3*x^3*(3*a^2*d^2 + b^2*c^2 + 6*a*b*c*d))/3 + (B*d*g^2*i^3*x^4*(a^2*d^2 + 3*b^2*c^2 + 6*a*b*c*d))/4 + (B*b^2*d^3*g^2*i^3*x^6)/6 + (B*a*c^2*g^2*i^3*x^2*(3*a*d + 2*b*c))/2 + (B*b*d^2*g^2*i^3*x^5*(2*a*d + 3*b*c))/5) - (log(a + b*x)*(B*a^6*d^3*g^2*i^3*n - 20*B*a^3*b^3*c^3*g^2*i^3*n + 15*B*a^4*b^2*c^2*d*g^2*i^3*n - 6*B*a^5*b*c*d^2*g^2*i^3*n))/(60*b^4) - (log(c + d*x)*(B*b^2*c^6*g^2*i^3*n + 15*B*a^2*c^4*d^2*g^2*i^3*n - 6*B*a*b*c^5*d*g^2*i^3*n))/(60*d^3) + (A*b^2*d^3*g^2*i^3*x^6)/6

3.129 $\int (ag+bgx)(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=283

$$\frac{B(bc-ad)^4gi^3nx}{20b^3d}+\frac{B(bc-ad)^3gi^3n(c+dx)^2}{40b^2d^2}+\frac{B(bc-ad)^2gi^3n(c+dx)^3}{60bd^2}-\frac{B(bc-ad)gi^3n(c+dx)^4}{20d^2}-\frac{(bc-$$

```
[Out] 1/20*B*(-a*d+b*c)^4*g*i^3*n*x/b^3/d+1/40*B*(-a*d+b*c)^3*g*i^3*n*(d*x+c)^2/b
^2/d^2+1/60*B*(-a*d+b*c)^2*g*i^3*n*(d*x+c)^3/b/d^2-1/20*B*(-a*d+b*c)*g*i^3*
n*(d*x+c)^4/d^2-1/4*(-a*d+b*c)*g*i^3*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^
n))/d^2+1/5*b*g*i^3*(d*x+c)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^2+1/20*B*(-
a*d+b*c)^5*g*i^3*n*ln((b*x+a)/(d*x+c))/b^4/d^2+1/20*B*(-a*d+b*c)^5*g*i^3*n*
ln(d*x+c)/b^4/d^2
```

Rubi [A]
time = 0.17, antiderivative size = 283, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.122$, Rules used = {2561, 45, 2382, 12, 78}

$$-\frac{gi^3(c+dx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^2}+\frac{bgi^3(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d^2}+\frac{Bgi^3n(bc-ad)^5\log\left(\frac{a+bx}{c+dx}\right)}{20b^4d^2}+\frac{Bgi^3n(bc-ad)^5\log(c+dx)}{20b^4d^2}+\frac{Bgi^3nx(bc-ad)^4}{20b^3d}+\frac{Bgi^3n(c+dx)^2(bc-ad)^3}{40b^2d^2}+\frac{Bgi^3n(c+dx)^3(bc-ad)^2}{60bd^2}-\frac{Bgi^3n(c+dx)^4(bc-ad)}{20d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (B*(b*c - a*d)^4*g*i^3*n*x)/(20*b^3*d) + (B*(b*c - a*d)^3*g*i^3*n*(c + d*x)
^2)/(40*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*n*(c + d*x)^3)/(60*b*d^2) - (B*(b
*c - a*d)*g*i^3*n*(c + d*x)^4)/(20*d^2) - ((b*c - a*d)*g*i^3*(c + d*x)^4*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^2) + (b*g*i^3*(c + d*x)^5*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^2) + (B*(b*c - a*d)^5*g*i^3*n*Log[(a
 + b*x)/(c + d*x)])/(20*b^4*d^2) + (B*(b*c - a*d)^5*g*i^3*n*Log[c + d*x])/(
20*b^4*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (129c+129dx)^3(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx=\int\left(\left(\frac{(-bc+ad)g(129c+129dx)^3\left(A+\right.}{d}\right.\right.$$

$$=\frac{(bg)\int(129c+129dx)^4\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{129d}$$

$$=-\frac{2146689(bc-ad)g(c+dx)^4\left(A+B\log\right.}{4d^2}$$

$$=-\frac{2146689(bc-ad)g(c+dx)^4\left(A+B\log\right.}{4d^2}$$

$$=-\frac{2146689(bc-ad)g(c+dx)^4\left(A+B\log\right.}{4d^2}$$

$$=\frac{2146689B(bc-ad)^4gnx}{20b^3d}+\frac{2146689B(bc}{}$$

Mathematica [A]

time = 0.15, size = 269, normalized size = 0.95

$$\frac{gi^3\left(\frac{5B(bc-ad)^2n\left(6bd(bc-ad)^2x+3b^2(bc-ad)(c+dx)^2+2b^3(c+dx)^3+6(bc-ad)^3\log(a+bx)\right)}{b^4}-\frac{2B(bc-ad)n\left(12bd(bc-ad)^3x+6b^2(bc-ad)^2(c+dx)^2+4b^3(bc-ad)(c+dx)^3+3b^4(c+dx)^4+12(bc-ad)^4\log(a+bx)\right)}{b^4}-30(bc-ad)(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+24b(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\right)}{120d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]),x]
```

```
[Out] (g*i^3*((5*B*(b*c - a*d)^2*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c
+ d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/b^4 - (2*B*(b
*c - a*d)*n*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b
^3*(b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b
*x]))/b^4 - 30*(b*c - a*d)*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]) + 24*b*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(120*d^2)
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int (bgx + ag)(dix + ci)^3 \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1061 vs. 2(245) = 490.
time = 0.31, size = 1061, normalized size = 3.75

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="maxima")
```

```
[Out] -1/5*I*B*b*d^3*g*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/5*I*A*b*d^3
*g*x^5 - 3/4*I*B*b*c*d^2*g*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4
*I*B*a*d^3*g*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/4*I*A*b*c*d^2*g
*x^4 - 1/4*I*A*a*d^3*g*x^4 - I*B*b*c^2*d*g*x^3*log((b*x/(d*x + c) + a/(d*x
+ c))^n*e) - I*B*a*c*d^2*g*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A
*b*c^2*d*g*x^3 - I*A*a*c*d^2*g*x^3 - 1/2*I*B*b*c^3*g*x^2*log((b*x/(d*x + c)
 + a/(d*x + c))^n*e) - 3/2*I*B*a*c^2*d*g*x^2*log((b*x/(d*x + c) + a/(d*x +
c))^n*e) - 1/2*I*A*b*c^3*g*x^2 - 3/2*I*A*a*c^2*d*g*x^2 - 1/60*I*B*b*d^3*g*n
*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3
*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x
^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) + 1/8*I*B*b*c*d^2*g*n*(6*a^4*log(
b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*
(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/24*I*
```

```
B*a*d^3*g*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^
2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*
x)/(b^3*d^3)) - 1/2*I*B*b*c^2*d*g*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x
 + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))
- 1/2*I*B*a*c*d^2*g*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/2*I*B*b*c^
3*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) +
 3/2*I*B*a*c^2*d*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c -
a*d)*x/(b*d)) - I*B*a*c^3*g*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) - I*B*a
*c^3*g*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A*a*c^3*g*x
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 603 vs. $2(245) = 490$.
time = 0.50, size = 603, normalized size = 2.13

$$-\frac{24\,(i\,A+i\,B)b^5d^5gx^5+6\,((-i\,Bb^5cd^4+i\,Bab^4d^5)gn+5\,(3\,(i\,A+i\,B)b^5cd^4+(i\,A+i\,B)ab^4d^5)g)x^4+2\,((-11i\,Bb^5c^2d^3+10i\,Bab^4cd^4+i\,Ba^2b^3d^5)gn+60\,((i\,A+i\,B)b^5c^2d^3+(i\,A+i\,B)ab^4cd^4)g)x^3+6\,(10i\,Ba^2b^3c^3d^2-10i\,Ba^3b^2c^2d^3+5i\,Ba^4bcd^4-i\,Ba^5d^5)gn\log\left(\frac{bx+a}{b}\right)+6\,(i\,Bb^5c^5-5i\,Bab^4c^4d)gn\log\left(\frac{dx+c}{d}\right)+3\,((-9i\,Bb^5c^3d^2+5i\,Bab^4c^2d^3+5i\,Ba^2b^3cd^4-i\,Ba^3b^2d^5)gn+20\,((i\,A+i\,B)b^5c^3d^2+3\,(i\,A+i\,B)ab^4c^2d^3)g)x^2+6\,(20\,(i\,A+i\,B)ab^4c^3d^2g+(-i\,Bb^5c^4d-5i\,Bab^4c^3d^2+10i\,Ba^2b^3c^2d^3-5i\,Ba^3b^2cd^4+i\,Ba^4bd^5)gn)x+6\,(4i\,Bb^5d^5gnx^5+20i\,Bab^4c^3d^2gnx+5\,(3i\,Bb^5cd^4+i\,Bab^4d^5)gnx^4+20\,(i\,Bb^5c^2d^3+i\,Bab^4cd^4)gnx^3+10\,(i\,Bb^5c^3d^2+3i\,Bab^4c^2d^3)gnx^2)\log\left(\frac{bx+a}{dx+c}\right)}{120\,b^4d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="fricas")
```

```
[Out] -1/120*(24*(I*A + I*B)*b^5*d^5*g*x^5 + 6*((-I*B*b^5*c*d^4 + I*B*a*b^4*d^5)*
g*n + 5*(3*(I*A + I*B)*b^5*c*d^4 + (I*A + I*B)*a*b^4*d^5)*g)*x^4 + 2*((-11*
I*B*b^5*c^2*d^3 + 10*I*B*a*b^4*c*d^4 + I*B*a^2*b^3*d^5)*g*n + 60*((I*A + I*
B)*b^5*c^2*d^3 + (I*A + I*B)*a*b^4*c*d^4)*g)*x^3 + 6*(10*I*B*a^2*b^3*c^3*d^
2 - 10*I*B*a^3*b^2*c^2*d^3 + 5*I*B*a^4*b*c*d^4 - I*B*a^5*d^5)*g*n*log((b*x
+ a)/b) + 6*(I*B*b^5*c^5 - 5*I*B*a*b^4*c^4*d)*g*n*log((d*x + c)/d) + 3*((-9
*I*B*b^5*c^3*d^2 + 5*I*B*a*b^4*c^2*d^3 + 5*I*B*a^2*b^3*c*d^4 - I*B*a^3*b^2*
d^5)*g*n + 20*((I*A + I*B)*b^5*c^3*d^2 + 3*(I*A + I*B)*a*b^4*c^2*d^3)*g)*x^
2 + 6*(20*(I*A + I*B)*a*b^4*c^3*d^2*g + (-I*B*b^5*c^4*d - 5*I*B*a*b^4*c^3*d
^2 + 10*I*B*a^2*b^3*c^2*d^3 - 5*I*B*a^3*b^2*c*d^4 + I*B*a^4*b*d^5)*g*n)*x +
 6*(4*I*B*b^5*d^5*g*n*x^5 + 20*I*B*a*b^4*c^3*d^2*g*n*x + 5*(3*I*B*b^5*c*d^4
 + I*B*a*b^4*d^5)*g*n*x^4 + 20*(I*B*b^5*c^2*d^3 + I*B*a*b^4*c*d^4)*g*n*x^3
+ 10*(I*B*b^5*c^3*d^2 + 3*I*B*a*b^4*c^2*d^3)*g*n*x^2)*log((b*x + a)/(d*x +
c)))/(b^4*d^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2372 vs. $2(245) = 490$.
time = 4.09, size = 2372, normalized size = 8.38

Too large to display

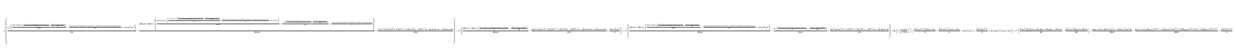
Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="giac")
```

```
[Out] 1/120*(6*(I*B*b^7*c^6*g*n - 6*I*B*a*b^6*c^5*d*g*n + 5*(-I*b*x - I*a)*B*b^6*
c^6*d*g*n/(d*x + c) + 15*I*B*a^2*b^5*c^4*d^2*g*n + 30*(I*b*x + I*a)*B*a*b^5
*c^5*d^2*g*n/(d*x + c) - 20*I*B*a^3*b^4*c^3*d^3*g*n + 75*(-I*b*x - I*a)*B*a
^2*b^4*c^4*d^3*g*n/(d*x + c) + 15*I*B*a^4*b^3*c^2*d^4*g*n + 100*(I*b*x + I*
a)*B*a^3*b^3*c^3*d^4*g*n/(d*x + c) - 6*I*B*a^5*b^2*c*d^5*g*n + 75*(-I*b*x -
 I*a)*B*a^4*b^2*c^2*d^5*g*n/(d*x + c) + I*B*a^6*b*d^6*g*n + 30*(I*b*x + I*a
)*B*a^5*b*c*d^6*g*n/(d*x + c) + 5*(-I*b*x - I*a)*B*a^6*d^7*g*n/(d*x + c))*l
og((b*x + a)/(d*x + c))/(b^5*d^2 - 5*(b*x + a)*b^4*d^3/(d*x + c) + 10*(b*x
+ a)^2*b^3*d^4/(d*x + c)^2 - 10*(b*x + a)^3*b^2*d^5/(d*x + c)^3 + 5*(b*x +
a)^4*b*d^6/(d*x + c)^4 - (b*x + a)^5*d^7/(d*x + c)^5) + (-5*I*B*b^10*c^6*g*
n + 30*I*B*a*b^9*c^5*d*g*n - 31*(-I*b*x - I*a)*B*b^9*c^6*d*g*n/(d*x + c) -
75*I*B*a^2*b^8*c^4*d^2*g*n - 186*(I*b*x + I*a)*B*a*b^8*c^5*d^2*g*n/(d*x + c
) - 47*I*(b*x + a)^2*B*b^8*c^6*d^2*g*n/(d*x + c)^2 + 100*I*B*a^3*b^7*c^3*d^
3*g*n - 465*(-I*b*x - I*a)*B*a^2*b^7*c^4*d^3*g*n/(d*x + c) + 282*I*(b*x + a
)^2*B*a*b^7*c^5*d^3*g*n/(d*x + c)^2 + 27*I*(b*x + a)^3*B*b^7*c^6*d^3*g*n/(d
*x + c)^3 - 75*I*B*a^4*b^6*c^2*d^4*g*n - 620*(I*b*x + I*a)*B*a^3*b^6*c^3*d^
4*g*n/(d*x + c) - 705*I*(b*x + a)^2*B*a^2*b^6*c^4*d^4*g*n/(d*x + c)^2 - 162
*I*(b*x + a)^3*B*a*b^6*c^5*d^4*g*n/(d*x + c)^3 - 6*I*(b*x + a)^4*B*b^6*c^6*
d^4*g*n/(d*x + c)^4 + 30*I*B*a^5*b^5*c*d^5*g*n - 465*(-I*b*x - I*a)*B*a^4*b
^5*c^2*d^5*g*n/(d*x + c) + 940*I*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g*n/(d*x + c
)^2 + 405*I*(b*x + a)^3*B*a^2*b^5*c^4*d^5*g*n/(d*x + c)^3 + 36*I*(b*x + a)^
4*B*a*b^5*c^5*d^5*g*n/(d*x + c)^4 - 5*I*B*a^6*b^4*d^6*g*n - 186*(I*b*x + I*
a)*B*a^5*b^4*c*d^6*g*n/(d*x + c) - 705*I*(b*x + a)^2*B*a^4*b^4*c^2*d^6*g*n/
(d*x + c)^2 - 540*I*(b*x + a)^3*B*a^3*b^4*c^3*d^6*g*n/(d*x + c)^3 - 90*I*(b
*x + a)^4*B*a^2*b^4*c^4*d^6*g*n/(d*x + c)^4 - 31*(-I*b*x - I*a)*B*a^6*b^3*d
^7*g*n/(d*x + c) + 282*I*(b*x + a)^2*B*a^5*b^3*c*d^7*g*n/(d*x + c)^2 + 405*
I*(b*x + a)^3*B*a^4*b^3*c^2*d^7*g*n/(d*x + c)^3 + 120*I*(b*x + a)^4*B*a^3*b
^3*c^3*d^7*g*n/(d*x + c)^4 - 47*I*(b*x + a)^2*B*a^6*b^2*d^8*g*n/(d*x + c)^2
 - 162*I*(b*x + a)^3*B*a^5*b^2*c*d^8*g*n/(d*x + c)^3 - 90*I*(b*x + a)^4*B*a
^4*b^2*c^2*d^8*g*n/(d*x + c)^4 + 27*I*(b*x + a)^3*B*a^6*b*d^9*g*n/(d*x + c)
^3 + 36*I*(b*x + a)^4*B*a^5*b*c*d^9*g*n/(d*x + c)^4 - 6*I*(b*x + a)^4*B*a^6
*d^10*g*n/(d*x + c)^4 + 6*I*A*b^10*c^6*g + 6*I*B*b^10*c^6*g - 36*I*A*a*b^9*
c^5*d*g - 36*I*B*a*b^9*c^5*d*g - 30*(I*b*x + I*a)*A*b^9*c^6*d*g/(d*x + c) -
 30*(I*b*x + I*a)*B*b^9*c^6*d*g/(d*x + c) + 90*I*A*a^2*b^8*c^4*d^2*g + 90*I
*B*a^2*b^8*c^4*d^2*g - 180*(-I*b*x - I*a)*A*a*b^8*c^5*d^2*g/(d*x + c) - 180
```

```
*(-I*b*x - I*a)*B*a*b^8*c^5*d^2*g/(d*x + c) - 120*I*A*a^3*b^7*c^3*d^3*g - 1
20*I*B*a^3*b^7*c^3*d^3*g - 450*(I*b*x + I*a)*A*a^2*b^7*c^4*d^3*g/(d*x + c)
- 450*(I*b*x + I*a)*B*a^2*b^7*c^4*d^3*g/(d*x + c) + 90*I*A*a^4*b^6*c^2*d^4*
g + 90*I*B*a^4*b^6*c^2*d^4*g - 600*(-I*b*x - I*a)*A*a^3*b^6*c^3*d^4*g/(d*x
+ c) - 600*(-I*b*x - I*a)*B*a^3*b^6*c^3*d^4*g/(d*x + c) - 36*I*A*a^5*b^5*c*
d^5*g - 36*I*B*a^5*b^5*c*d^5*g - 450*(I*b*x + I*a)*A*a^4*b^5*c^2*d^5*g/(d*x
 + c) - 450*(I*b*x + I*a)*B*a^4*b^5*c^2*d^5*g/(d*x + c) + 6*I*A*a^6*b^4*d^6
*g + 6*I*B*a^6*b^4*d^6*g - 180*(-I*b*x - I*a)*A*a^5*b^4*c*d^6*g/(d*x + c) -
 180*(-I*b*x - I*a)*B*a^5*b^4*c*d^6*g/(d*x + c) - 30*(I*b*x + I*a)*A*a^6*b^
3*d^7*g/(d*x + c) - 30*(I*b*x + I*a)*B*a^6*b^3*d^7*g/(d*x + c))/(b^8*d^2 -
5*(b*x + a)*b^7*d^3/(d*x + c) + 10*(b*x + a)^2*b^6*d^4/(d*x + c)^2 - 10*(b*
x + a)^3*b^5*d^5/(d*x + c)^3 + 5*(b*x + a)^4*b^4*d^6/(d*x + c)^4 - (b*x + a
)^5*b^3*d^7/(d*x + c)^5) + 6*(I*B*b^6*c^6*g*n - 6*I*B*a*b^5*c^5*d*g*n + 15*
I*B*a^2*b^4*c^4*d^2*g*n - 20*I*B*a^3*b^3*c^3*d^3*g*n + 15*I*B*a^4*b^2*c^2*d
^4*g*n - 6*I*B*a^5*b*c*d^5*g*n + I*B*a^6*d^6*g*n)*log(b - (b*x + a)*d/(d*x
+ c))/(b^4*d^2) + 6*(-I*B*b^6*c^6*g*n + 6*I*B*a*b^5*c^5*d*g*n - 15*I*B*a^2*
b^4*c^4*d^2*g*n + 20*I*B*a^3*b^3*c^3*d^3*g*n - 15*I*B*a^4*b^2*c^2*d^4*g*n +
 6*I*B*a^5*b*c*d^5*g*n - I*B*a^6*d^6*g*n)*log((b*x + a)/(d*x + c))/(b^4*d^2
))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 5.40, size = 1234, normalized size = 4.36



Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] x*((a*c*(((20*a*d + 20*b*c)*((d^2*g*i^3*(10*A*a*d + 20*A*b*c + B*a*d*n - B*
b*c*n))/5 - (A*d^2*g*i^3*(20*a*d + 20*b*c))/20))/(20*b*d) - (d*g*i^3*(4*A*a
^2*d^2 + 24*A*b^2*c^2 + B*a^2*d^2*n - 3*B*b^2*c^2*n + 32*A*a*b*c*d + 2*B*a*
b*c*d*n))/(4*b) + A*a*c*d^2*g*i^3))/(b*d) - ((20*a*d + 20*b*c)*(((20*a*d +
20*b*c)*(((20*a*d + 20*b*c)*((d^2*g*i^3*(10*A*a*d + 20*A*b*c + B*a*d*n - B*
b*c*n))/5 - (A*d^2*g*i^3*(20*a*d + 20*b*c))/20))/(20*b*d) - (d*g*i^3*(4*A*a
^2*d^2 + 24*A*b^2*c^2 + B*a^2*d^2*n - 3*B*b^2*c^2*n + 32*A*a*b*c*d + 2*B*a*
b*c*d*n))/(4*b) + A*a*c*d^2*g*i^3))/(20*b*d) - (a*c*((d^2*g*i^3*(10*A*a*d +
 20*A*b*c + B*a*d*n - B*b*c*n))/5 - (A*d^2*g*i^3*(20*a*d + 20*b*c))/20))/(b
*d) + (c*g*i^3*(4*A*a^2*d^2 + 4*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 12*
A*a*b*c*d))/b))/(20*b*d) + (c^2*g*i^3*(12*A*a^2*d^2 + 2*A*b^2*c^2 + 3*B*a^2
*d^2*n - B*b^2*c^2*n + 16*A*a*b*c*d - 2*B*a*b*c*d*n))/(2*b*d)) - x^3*(((20*
a*d + 20*b*c)*((d^2*g*i^3*(10*A*a*d + 20*A*b*c + B*a*d*n - B*b*c*n))/5 - (A
*d^2*g*i^3*(20*a*d + 20*b*c))/20))/(60*b*d) - (d*g*i^3*(4*A*a^2*d^2 + 24*A*
b^2*c^2 + B*a^2*d^2*n - 3*B*b^2*c^2*n + 32*A*a*b*c*d + 2*B*a*b*c*d*n))/(12*
b) + (A*a*c*d^2*g*i^3)/3) + x^2*(((20*a*d + 20*b*c)*(((20*a*d + 20*b*c)*((d
^2*g*i^3*(10*A*a*d + 20*A*b*c + B*a*d*n - B*b*c*n))/5 - (A*d^2*g*i^3*(20*a*
```

```
d + 20*b*c))/20))/(20*b*d) - (d*g*i^3*(4*A*a^2*d^2 + 24*A*b^2*c^2 + B*a^2*d
^2*n - 3*B*b^2*c^2*n + 32*A*a*b*c*d + 2*B*a*b*c*d*n))/(4*b) + A*a*c*d^2*g*i
^3))/(40*b*d) - (a*c*((d^2*g*i^3*(10*A*a*d + 20*A*b*c + B*a*d*n - B*b*c*n))
/5 - (A*d^2*g*i^3*(20*a*d + 20*b*c))/20))/(2*b*d) + (c*g*i^3*(4*A*a^2*d^2 +
 4*A*b^2*c^2 + B*a^2*d^2*n - B*b^2*c^2*n + 12*A*a*b*c*d))/(2*b)) + log(e*((
a + b*x)/(c + d*x))^n)*((B*c^2*g*i^3*x^2*(3*a*d + b*c))/2 + (B*d^2*g*i^3*x^
4*(a*d + 3*b*c))/4 + B*a*c^3*g*i^3*x + (B*b*d^3*g*i^3*x^5)/5 + B*c*d*g*i^3*
x^3*(a*d + b*c)) + x^4*((d^2*g*i^3*(10*A*a*d + 20*A*b*c + B*a*d*n - B*b*c*n
))/20 - (A*d^2*g*i^3*(20*a*d + 20*b*c))/80) + (log(c + d*x)*(B*b*c^5*g*i^3*
n - 5*B*a*c^4*d*g*i^3*n))/(20*d^2) - (log(a + b*x)*(B*a^5*d^3*g*i^3*n - 10*
B*a^2*b^3*c^3*g*i^3*n - 5*B*a^4*b*c*d^2*g*i^3*n + 10*B*a^3*b^2*c^2*d*g*i^3*
n))/(20*b^4) + (A*b*d^3*g*i^3*x^5)/5
```

3.130 $\int (ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=156

$$-\frac{B(bc-ad)^3i^3nx}{4b^3}-\frac{B(bc-ad)^2i^3n(c+dx)^2}{8b^2d}-\frac{B(bc-ad)i^3n(c+dx)^3}{12bd}-\frac{B(bc-ad)^4i^3n\log(a+bx)}{4b^4d}+\frac{i^3(c$$

```
[Out] -1/4*B*(-a*d+b*c)^3*i^3*n*x/b^3-1/8*B*(-a*d+b*c)^2*i^3*n*(d*x+c)^2/b^2/d-1/
12*B*(-a*d+b*c)*i^3*n*(d*x+c)^3/b/d-1/4*B*(-a*d+b*c)^4*i^3*n*ln(b*x+a)/b^4/
d+1/4*i^3*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d
```

Rubi [A]
time = 0.07, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2547, 21, 45}

$$\frac{i^3(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d}-\frac{Bi^3n(bc-ad)^4\log(a+bx)}{4b^4d}-\frac{Bi^3nx(bc-ad)^3}{4b^3}-\frac{Bi^3n(c+dx)^2(bc-ad)^2}{8b^2d}-\frac{Bi^3n(c+dx)^3(bc-ad)}{12bd}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -1/4*(B*(b*c - a*d)^3*i^3*n*x)/b^3 - (B*(b*c - a*d)^2*i^3*n*(c + d*x)^2)/(8
*b^2*d) - (B*(b*c - a*d)*i^3*n*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*i^3
*n*Log[a + b*x])/(4*b^4*d) + (i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(4*d)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2547

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*((A +
 B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 1))), x] - Dist[B*n*((b*c - a*d)
/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ
```

```
[{a, b, c, d, e, f, g, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &
& NeQ[m, -2]
```

Rubi steps

$$\int (130c+130dx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx = \frac{549250(c+dx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d} - \frac{(Bn)\int 2}{}$$
$$= \frac{549250(c+dx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d} - \frac{(549250B}{}$$
$$= \frac{549250(c+dx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d} - \frac{(549250B}{}$$
$$= -\frac{549250B(bc-ad)^3nx}{b^3} - \frac{274625B(bc-ad)^2n(c+}{b^2d}$$

Mathematica [**A**]
time = 0.05, size = 124, normalized size = 0.79

$$\frac{i^3\left(-\frac{B(bc-ad)n(6bd(bc-ad)^2x+3b^2(bc-ad)(c+dx)^2+2b^3(c+dx)^3+6(bc-ad)^3\log(a+bx))}{6b^4}+(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (i^3*(-1/6*(B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c +
 d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/b^4 + (c + d*x
)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(4*d)
```

Maple [**F**]
time = 0.12, size = 0, normalized size = 0.00

$$\int (dix+ci)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 452 vs. 2(132) = 264.
time = 0.27, size = 452, normalized size = 2.90

$$-\frac{1}{4}i\,Bd^3x^4\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)-\frac{1}{4}i\,Ad^3x^4-i\,Bcd^2x^3\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)-i\,Acd^2x^3-\frac{3}{2}i\,Bc^2dx^2\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)-\frac{3}{2}i\,Ac^2dx^2+\frac{1}{24}i\,Bd^3n\left(\frac{6\,a^4\log(bx+a)}{b^4}-\frac{6\,c^4\log(dx+c)}{d^4}+\frac{2\,(b^3cd^2-ab^2d^3)x^3-3\,(b^3c^2d-a^2bd^3)x^2+6\,(b^3c^3-a^3d^3)x}{b^3d^3}\right)-\frac{1}{2}i\,Bcd^2n\left(\frac{2\,a^3\log(bx+a)}{b^3}-\frac{2\,c^3\log(dx+c)}{d^3}-\frac{(b^2cd-abd^2)x^2-2\,(b^2c^2-a^2d^2)x}{b^2d^2}\right)+\frac{3}{2}i\,Bc^2dn\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)-i\,Bc^3n\left(\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)-i\,Bc^3x\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)-i\,Ac^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] -1/4*I*B*d^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*I*A*d^3*x^4 -
 I*B*c*d^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A*c*d^2*x^3 - 3/2
*I*B*c^2*d*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/2*I*A*c^2*d*x^2 +
 1/24*I*B*d^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*
c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d
^3)*x)/(b^3*d^3)) - 1/2*I*B*c*d^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x
 + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))
+ 3/2*I*B*c^2*d*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d
)*x/(b*d)) - I*B*c^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) - I*B*c^3*x*lo
g((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A*c^3*x
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 355 vs. $2(132) = 264$.
time = 0.40, size = 355, normalized size = 2.28

$$-\frac{6\,(i\,A+i\,B)b^4d^4x^4-6i\,Bb^4c^4n\log\left(\frac{dx+c}{d}\right)+2\,(12\,(i\,A+i\,B)b^4cd^3+(-i\,Bb^4cd^3+i\,Bab^3d^4)n)x^3+3\,(12\,(i\,A+i\,B)b^4c^2d^2+(-3i\,Bb^4c^2d^2+4i\,Bab^3cd^3-i\,Ba^2b^2d^4)n)x^2+6\,(4i\,Bab^3c^3d-6i\,Ba^2b^2c^2d^2+4i\,Ba^3bcd^3-i\,Ba^4d^4)n\log\left(\frac{bx+a}{b}\right)+6\,(4\,(i\,A+i\,B)b^4c^3d+(-3i\,Bb^4c^3d+6i\,Bab^3c^2d^2-4i\,Ba^2b^2cd^3+i\,Ba^3bd^4)n)x+6\,(i\,Bb^4d^4nx^4+4i\,Bb^4cd^3nx^3+6i\,Bb^4c^2d^2nx^2+4i\,Bb^4c^3dnx)\log\left(\frac{bx+a}{dx+c}\right)}{24\,b^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] -1/24*(6*(I*A + I*B)*b^4*d^4*x^4 - 6*I*B*b^4*c^4*n*log((d*x + c)/d) + 2*(12
*(I*A + I*B)*b^4*c*d^3 + (-I*B*b^4*c*d^3 + I*B*a*b^3*d^4)*n)*x^3 + 3*(12*(I
*A + I*B)*b^4*c^2*d^2 + (-3*I*B*b^4*c^2*d^2 + 4*I*B*a*b^3*c*d^3 - I*B*a^2*b
^2*d^4)*n)*x^2 + 6*(4*I*B*a*b^3*c^3*d - 6*I*B*a^2*b^2*c^2*d^2 + 4*I*B*a^3*b
*c*d^3 - I*B*a^4*d^4)*n*log((b*x + a)/b) + 6*(4*(I*A + I*B)*b^4*c^3*d + (-3
*I*B*b^4*c^3*d + 6*I*B*a*b^3*c^2*d^2 - 4*I*B*a^2*b^2*c*d^3 + I*B*a^3*b*d^4)
*n)*x + 6*(I*B*b^4*d^4*n*x^4 + 4*I*B*b^4*c*d^3*n*x^3 + 6*I*B*b^4*c^2*d^2*n*
x^2 + 4*I*B*b^4*c^3*d*n*x)*log((b*x + a)/(d*x + c)))/(b^4*d)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1249 vs. $2(132) = 264$.

time = 4.29, size = 1249, normalized size = 8.01

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] -1/24*(6*(I*B*b^5*c^5*n - 5*I*B*a*b^4*c^4*d*n + 10*I*B*a^2*b^3*c^3*d^2*n -
10*I*B*a^3*b^2*c^2*d^3*n + 5*I*B*a^4*b*c*d^4*n - I*B*a^5*d^5*n)*log((b*x +
a)/(d*x + c))/(b^4*d - 4*(b*x + a)*b^3*d^2/(d*x + c) + 6*(b*x + a)^2*b^2*d^
3/(d*x + c)^2 - 4*(b*x + a)^3*b*d^4/(d*x + c)^3 + (b*x + a)^4*d^5/(d*x + c)
^4) - (11*I*B*b^8*c^5*n - 55*I*B*a*b^7*c^4*d*n - 26*(I*b*x + I*a)*B*b^7*c^5
*d*n/(d*x + c) + 110*I*B*a^2*b^6*c^3*d^2*n - 130*(-I*b*x - I*a)*B*a*b^6*c^4
*d^2*n/(d*x + c) + 21*I*(b*x + a)^2*B*b^6*c^5*d^2*n/(d*x + c)^2 - 110*I*B*a
^3*b^5*c^2*d^3*n - 260*(I*b*x + I*a)*B*a^2*b^5*c^3*d^3*n/(d*x + c) - 105*I*
(b*x + a)^2*B*a*b^5*c^4*d^3*n/(d*x + c)^2 - 6*I*(b*x + a)^3*B*b^5*c^5*d^3*n
/(d*x + c)^3 + 55*I*B*a^4*b^4*c*d^4*n - 260*(-I*b*x - I*a)*B*a^3*b^4*c^2*d^
4*n/(d*x + c) + 210*I*(b*x + a)^2*B*a^2*b^4*c^3*d^4*n/(d*x + c)^2 + 30*I*(b
*x + a)^3*B*a*b^4*c^4*d^4*n/(d*x + c)^3 - 11*I*B*a^5*b^3*d^5*n - 130*(I*b*x
 + I*a)*B*a^4*b^3*c*d^5*n/(d*x + c) - 210*I*(b*x + a)^2*B*a^3*b^3*c^2*d^5*n
/(d*x + c)^2 - 60*I*(b*x + a)^3*B*a^2*b^3*c^3*d^5*n/(d*x + c)^3 - 26*(-I*b*
x - I*a)*B*a^5*b^2*d^6*n/(d*x + c) + 105*I*(b*x + a)^2*B*a^4*b^2*c*d^6*n/(d
*x + c)^2 + 60*I*(b*x + a)^3*B*a^3*b^2*c^2*d^6*n/(d*x + c)^3 - 21*I*(b*x +
a)^2*B*a^5*b*d^7*n/(d*x + c)^2 - 30*I*(b*x + a)^3*B*a^4*b*c*d^7*n/(d*x + c)
^3 + 6*I*(b*x + a)^3*B*a^5*d^8*n/(d*x + c)^3 - 6*I*A*b^8*c^5 - 6*I*B*b^8*c^
5 + 30*I*A*a*b^7*c^4*d + 30*I*B*a*b^7*c^4*d - 60*I*A*a^2*b^6*c^3*d^2 - 60*I
*B*a^2*b^6*c^3*d^2 + 60*I*A*a^3*b^5*c^2*d^3 + 60*I*B*a^3*b^5*c^2*d^3 - 30*I
*A*a^4*b^4*c*d^4 - 30*I*B*a^4*b^4*c*d^4 + 6*I*A*a^5*b^3*d^5 + 6*I*B*a^5*b^3
*d^5)/(b^7*d - 4*(b*x + a)*b^6*d^2/(d*x + c) + 6*(b*x + a)^2*b^5*d^3/(d*x +
 c)^2 - 4*(b*x + a)^3*b^4*d^4/(d*x + c)^3 + (b*x + a)^4*b^3*d^5/(d*x + c)^4
) - 6*(-I*B*b^5*c^5*n + 5*I*B*a*b^4*c^4*d*n - 10*I*B*a^2*b^3*c^3*d^2*n + 10
*I*B*a^3*b^2*c^2*d^3*n - 5*I*B*a^4*b*c*d^4*n + I*B*a^5*d^5*n)*log(-b + (b*x
 + a)*d/(d*x + c))/(b^4*d) - 6*(I*B*b^5*c^5*n - 5*I*B*a*b^4*c^4*d*n + 10*I*
B*a^2*b^3*c^3*d^2*n - 10*I*B*a^3*b^2*c^2*d^3*n + 5*I*B*a^4*b*c*d^4*n - I*B*
a^5*d^5*n)*log((b*x + a)/(d*x + c))/(b^4*d))*(b*c/(b*c - a*d)^2 - a*d/(b*c
- a*d)^2)
```

Mupad [B]
time = 4.98, size = 588, normalized size = 3.77

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] x^3*((d^2*i^3*(4*A*a*d + 16*A*b*c + B*a*d*n - B*b*c*n))/(12*b) - (A*d^2*i^3
*(4*a*d + 4*b*c))/(12*b)) - x^2*((((d^2*i^3*(4*A*a*d + 16*A*b*c + B*a*d*n -
 B*b*c*n))/(4*b) - (A*d^2*i^3*(4*a*d + 4*b*c))/(4*b))*(4*a*d + 4*b*c))/(8*b
*d) - (c*d*i^3*(4*A*a*d + 6*A*b*c + B*a*d*n - B*b*c*n))/(2*b) + (A*a*c*d^2*
i^3)/(2*b)) + log(e*((a + b*x)/(c + d*x))^n)*((B*d^3*i^3*x^4)/4 + B*c^3*i^3
*x + (3*B*c^2*d*i^3*x^2)/2 + B*c*d^2*i^3*x^3) + x*(((4*a*d + 4*b*c)*((((d^2
*i^3*(4*A*a*d + 16*A*b*c + B*a*d*n - B*b*c*n))/(4*b) - (A*d^2*i^3*(4*a*d +
4*b*c))/(4*b))*(4*a*d + 4*b*c))/(4*b*d) - (c*d*i^3*(4*A*a*d + 6*A*b*c + B*a
*d*n - B*b*c*n))/b + (A*a*c*d^2*i^3)/b))/(4*b*d) + (c^2*i^3*(12*A*a*d + 8*A
*b*c + 3*B*a*d*n - 3*B*b*c*n))/(2*b) - (a*c*((d^2*i^3*(4*A*a*d + 16*A*b*c +
 B*a*d*n - B*b*c*n))/(4*b) - (A*d^2*i^3*(4*a*d + 4*b*c))/(4*b)))/(b*d)) - (
log(a + b*x)*(B*a^4*d^3*i^3*n - 4*B*a*b^3*c^3*i^3*n - 4*B*a^3*b*c*d^2*i^3*n
 + 6*B*a^2*b^2*c^2*d*i^3*n))/(4*b^4) + (A*d^3*i^3*x^4)/4 - (B*c^4*i^3*n*log
(c + d*x))/(4*d)
```

3.131 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=373

$$-\frac{5Bd(bc-ad)^2i^3nx}{6b^3g}-\frac{B(bc-ad)i^3n(c+dx)^2}{6b^2g}+\frac{d(bc-ad)^2i^3(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^4g}+\frac{(bc-ad)i^3(}{}$$

```
[Out] -5/6*B*d*(-a*d+b*c)^2*i^3*n*x/b^3/g-1/6*B*(-a*d+b*c)*i^3*n*(d*x+c)^2/b^2/g+
d*(-a*d+b*c)^2*i^3*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/g+1/2*(-a*d+
b*c)*i^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/g+1/3*i^3*(d*x+c)^3*
(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/g-5/6*B*(-a*d+b*c)^3*i^3*n*ln((b*x+a)/(d*
x+c))/b^4/g-11/6*B*(-a*d+b*c)^3*i^3*n*ln(d*x+c)/b^4/g-(-a*d+b*c)^3*i^3*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g+B*(-a*d+b*c)^3*
i^3*n*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g
```

Rubi [A]
time = 0.33, antiderivative size = 373, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.186, Rules used = {2561, 2389, 2379, 2438, 2351, 31, 2356, 46}

$$\frac{Bi^3n(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g}+\frac{di^3(a+bx)(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g}-\frac{i^3(bc-ad)^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g}+\frac{i^3(c+dx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g}+\frac{i^3(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3bg}-\frac{5Bi^3n(bc-ad)^3\log\left(\frac{a+bx}{c+dx}\right)}{6b^4g}-\frac{11Bi^3n(bc-ad)^3\log(c+dx)}{6b^4g}-\frac{5Bdi^3nx(bc-ad)^2}{6b^3g}-\frac{Bi^3n(c+dx)^2(bc-ad)}{6b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x),
x]
```

```
[Out] (-5*B*d*(b*c - a*d)^2*i^3*n*x)/(6*b^3*g) - (B*(b*c - a*d)*i^3*n*(c + d*x)^2
)/(6*b^2*g) + (d*(b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(b^4*g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(2*b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/(3*b*g) - (5*B*(b*c - a*d)^3*i^3*n*Log[(a + b*x)/(c + d*x)])/(6*b^4
*g) - (11*B*(b*c - a*d)^3*i^3*n*Log[c + d*x])/(6*b^4*g) - ((b*c - a*d)^3*i^
3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x)
)])/(b^4*g) + (B*(b*c - a*d)^3*i^3*n*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))
])/(b^4*g)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
```

```
NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(131c+131dx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx = \int \left(\frac{2248091d(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g} + \frac{17161d\right.$$

$$= \frac{\left(2248091(bc-ad)^3\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ag+bgx}\,dx}{b^3} + \frac{(131d)\int(131$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} + \frac{2248091(bc-ad)(c+dx)^2 (A+}{2b^2g}$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} + \frac{2248091Bd(bc-ad)^2(a+bx)\log}{b^4g}$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} + \frac{2248091Bd(bc-ad)^2(a+bx)\log}{b^4g}$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} - \frac{11240455Bd(bc-ad)^2nx}{6b^3g} - 224$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} - \frac{11240455Bd(bc-ad)^2nx}{6b^3g} - 224$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} - \frac{11240455Bd(bc-ad)^2nx}{6b^3g} - 224$$

Mathematica [A]
time = 0.19, size = 368, normalized size = 0.99

$$\frac{i^3\left(6Abd(bc-ad)^2x-3B(bc-ad)^2n(bdx+(bc-ad)\log(a+bx))-B(bc-ad)n(2bd(bc-ad)x+b^2(c+dx)^2+2(bc-ad)^2\log(a+bx))+6Bd(bc-ad)^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3b^2(bc-ad)(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2b^3(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+6(bc-ad)^3\log(g(a+bx))\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-6B(bc-ad)^3n\log(c+dx)-3B(bc-ad)^3n\left(\log(g(a+bx))\left(\log(g(a+bx))-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{6b^4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x),x]
```

```
[Out] (i^3*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c - a*d)*Lo
g[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b
*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b*x)/
(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*(b
*c - a*d)^3*Log[g*(a + b*x)]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*B*(
b*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[g*(a + b*x)]*(Log[g*
```

```
(a + b*x)] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))
/(-(b*c) + a*d)])))/(6*b^4*g)
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 757 vs. 2(340) = 680.
time = 0.58, size = 757, normalized size = 2.03

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="maxima")
```

```
[Out] -3*I*A*c^2*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + 1/6*I*A*d^3*(6*a^3*log(b*
x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) - 3/2*I*A*c*d^2
*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) - I*A*c^3*log(b*g*x
 + a*g)/(b*g) + 1/6*(11*I*b^2*c^3*n - 15*I*a*b*c^2*d*n + 6*I*a^2*c*d^2*n)*B
*log(d*x + c)/(b^3*g) + (-I*b^3*c^3*n + 3*I*a*b^2*c^2*d*n - 3*I*a^2*b*c*d^2
*n + I*a^3*d^3*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(
-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g) - 1/6*(2*I*B*b^3*d^3*x^3 + (a*b^2*d^
3*(I*n - 3*I) + b^3*c*d^2*(-I*n + 9*I))*B*x^2 - 3*(I*b^3*c^3*n - 3*I*a*b^2*
c^2*d*n + 3*I*a^2*b*c*d^2*n - I*a^3*d^3*n)*B*log(b*x + a)^2 - (6*a*b^2*c*d^
2*(-2*I*n + 3*I) - a^2*b*d^3*(-5*I*n + 6*I) - b^3*c^2*d*(-7*I*n + 18*I))*B*
x + (a^3*d^3*(11*I*n - 6*I) - 9*a^2*b*c*d^2*(3*I*n - 2*I) - 18*a*b^2*c^2*d*
(-I*n + I) + 6*I*b^3*c^3)*B*log(b*x + a) + (2*I*B*b^3*d^3*x^3 - 3*(-3*I*b^3
*c*d^2 + I*a*b^2*d^3)*B*x^2 - 6*(-3*I*b^3*c^2*d + 3*I*a*b^2*c*d^2 - I*a^2*b
*d^3)*B*x - 6*(-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*
B*log(b*x + a))*log((b*x + a)^n) + (-2*I*B*b^3*d^3*x^3 - 3*(3*I*b^3*c*d^2 -
 I*a*b^2*d^3)*B*x^2 - 6*(3*I*b^3*c^2*d - 3*I*a*b^2*c*d^2 + I*a^2*b*d^3)*B*x
 - 6*(I*b^3*c^3 - 3*I*a*b^2*c^2*d + 3*I*a^2*b*c*d^2 - I*a^3*d^3)*B*log(b*x
+ a))*log((d*x + c)^n))/(b^4*g)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="fricas")
```

```
[Out] integral(((-I*A - I*B)*d^3*x^3 - 3*(I*A + I*B)*c*d^2*x^2 - 3*(I*A + I*B)*c^
2*d*x + (-I*A - I*B)*c^3 + (-I*B*d^3*n*x^3 - 3*I*B*c*d^2*n*x^2 - 3*I*B*c^2*
d*n*x - I*B*c^3*n)*log((b*x + a)/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^3\left(\int \frac{Ac^3}{a+bx}\,dx + \int \frac{Ad^3x^3}{a+bx}\,dx + \int \frac{Bc^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx + \int \frac{3Acd^2x^2}{a+bx}\,dx + \int \frac{3Ac^2dx}{a+bx}\,dx + \int \frac{Bd^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx + \int \frac{3Bcd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx + \int \frac{3Bc^2dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g),x)
```

```
[Out] i**3*(Integral(A*c**3/(a + b*x), x) + Integral(A*d**3*x**3/(a + b*x), x) +
Integral(B*c**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x) + Int
egral(3*A*c*d**2*x**2/(a + b*x), x) + Integral(3*A*c**2*d*x/(a + b*x), x) +
 Integral(B*d**3*x**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x)
 + Integral(3*B*c*d**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*
x), x) + Integral(3*B*c**2*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a +
 b*x), x))/g
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(b*g*x + a
*g), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{a\,g+b\,g\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x),
x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x),
 x)
```

3.132 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=390

$$-\frac{Bd^2(bc-ad)i^3nx}{2b^3g^2}-\frac{B(bc-ad)^2i^3n(c+dx)}{b^3g^2(a+bx)}+\frac{2d^2(bc-ad)i^3(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^4g^2}-\frac{(bc-ad)^2}{}$$

```
[Out] -1/2*B*d^2*(-a*d+b*c)*i^3*n*x/b^3/g^2-B*(-a*d+b*c)^2*i^3*n*(d*x+c)/b^3/g^2/
(b*x+a)+2*d^2*(-a*d+b*c)*i^3*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/g^
2-(-a*d+b*c)^2*i^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/g^2/(b*x+a)+
1/2*d*i^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/g^2-1/2*B*d*(-a*d+b
*c)^2*i^3*n*ln((b*x+a)/(d*x+c))/b^4/g^2-5/2*B*d*(-a*d+b*c)^2*i^3*n*ln(d*x+c
)/b^4/g^2-3*d*(-a*d+b*c)^2*i^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+
c)/d/(b*x+a))/b^4/g^2+3*B*d*(-a*d+b*c)^2*i^3*n*polylog(2,b*(d*x+c)/d/(b*x+a
))/b^4/g^2
```

Rubi [A]
time = 0.29, antiderivative size = 390, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.209$, Rules used = {2561, 46, 2393, 2341, 2356, 2351, 31, 2379, 2438}

$$\frac{3Bdi^3n(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^2}+\frac{2d^2i^3(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^2}-\frac{3di^3(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^2}-\frac{i^3(c+dx)(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^2(a+bx)}+\frac{di^3(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g^2}-\frac{Bdi^3n(bc-ad)^2\log\left(\frac{a+bx}{c+dx}\right)}{2b^4g^2}-\frac{5Bdi^3n(bc-ad)^2\log(c+dx)}{2b^4g^2}-\frac{Bd^2i^3nx(bc-ad)}{2b^3g^2}-\frac{Bi^3n(c+dx)(bc-ad)^2}{b^3g^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
2,x]
```

```
[Out] -1/2*(B*d^2*(b*c - a*d)*i^3*n*x)/(b^3*g^2) - (B*(b*c - a*d)^2*i^3*n*(c + d*
x))/(b^3*g^2*(a + b*x)) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c + d*x)*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^2*(a + b*x)) + (d*i^3*(c + d*x)^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^2) - (B*d*(b*c - a*d)^2*i^3*n*
Log[(a + b*x)/(c + d*x)])/(2*b^4*g^2) - (5*B*d*(b*c - a*d)^2*i^3*n*Log[c +
d*x])/(2*b^4*g^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (3*B*d*(b*c - a*d)
^2*i^3*n*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(132c+132dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx = \int\left(\frac{2299968d^2(3bc-2ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^2}+\frac{229\ldots}{\ldots}\right.$$

$$= \frac{\left(2299968d^3\right)\int x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{b^2g^2}+\frac{\left(2299968d^2\ldots\right.}{\ldots}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2}+\frac{1149984d^3x^2\left(A+B\log\left(e\left(\frac{a}{c}\ldots\right.\right.\right.}{b^2g^2}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2}+\frac{2299968Bd^2(3bc-2ad)(a+\ldots}{b^4g^2}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2}+\frac{2299968Bd^2(3bc-2ad)(a+\ldots}{b^4g^2}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2}-\frac{1149984Bd^2(bc-ad)nx}{b^3g^2}-\frac{2\ldots}{\ldots}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2}-\frac{1149984Bd^2(bc-ad)nx}{b^3g^2}-\frac{2\ldots}{\ldots}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2}-\frac{1149984Bd^2(bc-ad)nx}{b^3g^2}-\frac{2\ldots}{\ldots}$$

Mathematica [A]
time = 0.28, size = 394, normalized size = 1.01

$$\frac{i^3\left(2Abd^2(3bc-2ad)x-bBd^2(bc-ad)nx-\frac{2B(bc-ad)^3n}{a+bx}-a^2Bd^3n\log(a+bx)-2Bd(bc-ad)^2n\log(a+bx)+2Bd^2(3bc-2ad)(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+b^2d^3x^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-\frac{2(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx}+6d(bc-ad)^2\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+b^2Bc^2dn\log(c+dx)+2Bd(bc-ad)^2n\log(c+dx)-2Bd(-bc+ad)(-3bc+2ad)n\log(c+dx)-3Bd(bc-ad)^2n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{2b^4g^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^2,x]
```

```
[Out] (i^3*(2*A*b*d^2*(3*b*c - 2*a*d)*x - b*B*d^2*(b*c - a*d)*n*x - (2*B*(b*c - a
*d)^3*n)/(a + b*x) - a^2*B*d^3*n*Log[a + b*x] - 2*B*d*(b*c - a*d)^2*n*Log[a
 + b*x] + 2*B*d^2*(3*b*c - 2*a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n]
+ b^2*d^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - (2*(b*c - a*d)^3*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + 6*d*(b*c - a*d)^2*Log[a +
b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + b^2*B*c^2*d*n*Log[c + d*x] +
2*B*d*(b*c - a*d)^2*n*Log[c + d*x] - 2*B*d*(-(b*c) + a*d)*(-3*b*c + 2*a*d)*
n*Log[c + d*x] - 3*B*d*(b*c - a*d)^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[
(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))
/(2*b^4*g^2)
```

Maple [**F**]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1458 vs. 2(358) = 716.
time = 0.62, size = 1458, normalized size = 3.74

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="maxima")
```

```
[Out] I*B*c^3*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) -
 d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + 3*I*A*(a^2/(b^4*g^2*x + a*b^3*g^2)
 - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*c*d^2 - 1/2*I*(2*a^3/(b^5*g^2*
x + a*b^4*g^2) + 6*a^2*log(b*x + a)/(b^4*g^2) + (b*x^2 - 4*a*x)/(b^3*g^2))*
A*d^3 - 3*I*A*c^2*d*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) +
I*B*c^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^2*g^2*x + a*b*g^2) + I*A*
c^3/(b^2*g^2*x + a*b*g^2) + 1/2*(5*I*b^3*c^3*d*n - 3*I*a*b^2*c^2*d^2*n - 2*
I*a^2*b*c*d^3*n + 2*I*a^3*d^4*n)*B*log(d*x + c)/(b^5*c*g^2 - a*b^4*d*g^2) -
 1/2*((I*b^4*c*d^3 - I*a*b^3*d^4)*B*x^3 + (a*b^3*c*d^3*(2*I*n - 9*I) + b^4*
c^2*d^2*(-I*n + 6*I) + a^2*b^2*d^4*(-I*n + 3*I))*B*x^2 + (a*b^3*c^2*d^2*(-I
*n + 6*I) - 2*a^2*b^2*c*d^3*(-I*n + 5*I) + a^3*b*d^4*(-I*n + 4*I))*B*x - 3*
((I*b^4*c^3*d*n - 3*I*a*b^3*c^2*d^2*n + 3*I*a^2*b^2*c*d^3*n - I*a^3*b*d^4*n
)*B*x + (I*a*b^3*c^3*d*n - 3*I*a^2*b^2*c^2*d^2*n + 3*I*a^3*b*c*d^3*n - I*a^
```

```
4*d^4*n)*B)*log(b*x + a)^2 - 2*(6*a^2*b^2*c^2*d^2*(I*n + I) + a^4*d^4*(I*n
+ I) + 3*a*b^3*c^3*d*(-I*n - I) + 4*a^3*b*c*d^3*(-I*n - I))*B + ((a^3*b*d^4
*(7*I*n - 6*I) - 6*a*b^3*c^2*d^2*(-2*I*n + 3*I) + a^2*b^2*c*d^3*(-17*I*n +
18*I) + 6*I*b^4*c^3*d)*B*x + (a^4*d^4*(7*I*n - 6*I) - 6*a^2*b^2*c^2*d^2*(-2
*I*n + 3*I) + a^3*b*c*d^3*(-17*I*n + 18*I) + 6*I*a*b^3*c^3*d)*B)*log(b*x +
a) + ((I*b^4*c*d^3 - I*a*b^3*d^4)*B*x^3 - 3*(-2*I*b^4*c^2*d^2 + 3*I*a*b^3*c
*d^3 - I*a^2*b^2*d^4)*B*x^2 - 2*(-3*I*a*b^3*c^2*d^2 + 5*I*a^2*b^2*c*d^3 - 2
*I*a^3*b*d^4)*B*x - 2*(-3*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c
*d^3 + I*a^4*d^4)*B - 6*((-I*b^4*c^3*d + 3*I*a*b^3*c^2*d^2 - 3*I*a^2*b^2*c*
d^3 + I*a^3*b*d^4)*B*x + (-I*a*b^3*c^3*d + 3*I*a^2*b^2*c^2*d^2 - 3*I*a^3*b*
c*d^3 + I*a^4*d^4)*B)*log(b*x + a))*log((b*x + a)^n) + ((-I*b^4*c*d^3 + I*a
*b^3*d^4)*B*x^3 - 3*(2*I*b^4*c^2*d^2 - 3*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)*B*x
^2 - 2*(3*I*a*b^3*c^2*d^2 - 5*I*a^2*b^2*c*d^3 + 2*I*a^3*b*d^4)*B*x - 2*(3*I
*a*b^3*c^3*d - 6*I*a^2*b^2*c^2*d^2 + 4*I*a^3*b*c*d^3 - I*a^4*d^4)*B - 6*((I
*b^4*c^3*d - 3*I*a*b^3*c^2*d^2 + 3*I*a^2*b^2*c*d^3 - I*a^3*b*d^4)*B*x + (I*
a*b^3*c^3*d - 3*I*a^2*b^2*c^2*d^2 + 3*I*a^3*b*c*d^3 - I*a^4*d^4)*B)*log(b*x
 + a))*log((d*x + c)^n))/(a*b^5*c*g^2 - a^2*b^4*d*g^2 + (b^6*c*g^2 - a*b^5*
d*g^2)*x) + 3*(-I*b^2*c^2*d*n + 2*I*a*b*c*d^2*n - I*a^2*d^3*n)*(log(b*x + a
)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B
/(b^4*g^2)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="fricas")
```

```
[Out] integral(((-I*A - I*B)*d^3*x^3 - 3*(I*A + I*B)*c*d^2*x^2 - 3*(I*A + I*B)*c^
2*d*x + (-I*A - I*B)*c^3 + (-I*B*d^3*n*x^3 - 3*I*B*c*d^2*n*x^2 - 3*I*B*c^2*
d*n*x - I*B*c^3*n)*log((b*x + a)/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a
^2*g^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(b*g*x + a
*g)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{(a\,g+b\,g\,x)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
2,x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
2, x)
```

3.133 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=361

$$-\frac{2Bd(bc-ad)i^3n(c+dx)}{b^3g^3(a+bx)}-\frac{B(bc-ad)i^3n(c+dx)^2}{4b^2g^3(a+bx)^2}+\frac{d^3i^3(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^4g^3}-\frac{2d(bc-ad)i^3}{}$$

```
[Out] -2*B*d*(-a*d+b*c)*i^3*n*(d*x+c)/b^3/g^3/(b*x+a)-1/4*B*(-a*d+b*c)*i^3*n*(d*x
+c)^2/b^2/g^3/(b*x+a)^2+d^3*i^3*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4
/g^3-2*d*(-a*d+b*c)*i^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/g^3/(b*
x+a)-1/2*(-a*d+b*c)*i^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/g^3/(
b*x+a)^2-B*d^2*(-a*d+b*c)*i^3*n*ln(d*x+c)/b^4/g^3-3*d^2*(-a*d+b*c)*i^3*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g^3+3*B*d^2*(-a*d
+b*c)*i^3*n*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g^3
```

Rubi [A]
time = 0.27, antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.186$, Rules used = {2561, 46, 2393, 2341, 2351, 31, 2379, 2438}

$$\frac{3Bd^2i^3n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^3}+\frac{d^3i^3(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^3}-\frac{3d^2i^3(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^3}-\frac{2di^3(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^3(a+bx)}-\frac{i^3(c+dx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g^3(a+bx)^2}-\frac{Bd^2i^3n(bc-ad)\log(c+dx)}{b^4g^3}-\frac{2Bdi^3n(c+dx)(bc-ad)}{b^3g^3(a+bx)}-\frac{Bi^3n(c+dx)^2(bc-ad)}{4b^2g^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
3,x]
```

```
[Out] (-2*B*d*(b*c - a*d)*i^3*n*(c + d*x))/(b^3*g^3*(a + b*x)) - (B*(b*c - a*d)*i
^3*n*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) + (d^3*i^3*(a + b*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*
(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^3*(a + b*x)^2)
 - (B*d^2*(b*c - a*d)*i^3*n*Log[c + d*x])/(b^4*g^3) - (3*d^2*(b*c - a*d)*i^
3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x)
)])/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*n*PolyLog[2, (b*(c + d*x))/(d*(a +
 b*x))])/(b^4*g^3)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
```

```
NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
n + 2, 0])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(133c+133dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx = \int\left(\frac{2352637d^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^3} + \frac{2352637(bc-a}{b}\right.$$

$$= \frac{(2352637d^3)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{b^3g^3} + \frac{(7057911d^2(}{}$$

$$= \frac{2352637Ad^3x}{b^3g^3} - \frac{2352637(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{2b^4g^3(a+bx)^2}$$

$$= \frac{2352637Ad^3x}{b^3g^3} + \frac{2352637Bd^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^3} - \frac{2}{}$$

$$= \frac{2352637Ad^3x}{b^3g^3} + \frac{2352637Bd^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^3} - \frac{2}{}$$

$$= \frac{2352637Ad^3x}{b^3g^3} - \frac{2352637B(bc-ad)^3n}{4b^4g^3(a+bx)^2} - \frac{11763185Bd(bc}{2b^4g^3(a+}$$

$$= \frac{2352637Ad^3x}{b^3g^3} - \frac{2352637B(bc-ad)^3n}{4b^4g^3(a+bx)^2} - \frac{11763185Bd(bc}{2b^4g^3(a+}$$

$$= \frac{2352637Ad^3x}{b^3g^3} - \frac{2352637B(bc-ad)^3n}{4b^4g^3(a+bx)^2} - \frac{11763185Bd(bc}{2b^4g^3(a+}$$

Mathematica [A]
time = 0.28, size = 331, normalized size = 0.92

$$\frac{i^3\left(4Abd^3x - \frac{B(bc-ad)^3n}{(a+bx)^2} - \frac{10Bd(bc-ad)^2n}{a+bx} + 10Bd^2(-bc+ad)n\log(a+bx) + 4Bd^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) - \frac{2(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)^2} - \frac{12d(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx} + 12d^2(bc-ad)\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) + 6Bd^2(bc-ad)n\log(c+dx) + 6Bd^2(-bc+ad)n\left(\log(a+bx)\left(\log(a+bx) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\operatorname{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{4b^4g^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^3,x]
```

```
[Out] (i^3*(4*A*b*d^3*x - (B*(b*c - a*d)^3*n)/(a + b*x)^2 - (10*B*d*(b*c - a*d)^2
*n)/(a + b*x) + 10*B*d^2*(-(b*c) + a*d)*n*Log[a + b*x] + 4*B*d^3*(a + b*x)*
Log[e*((a + b*x)/(c + d*x))^n] - (2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(a + b*x)^2 - (12*d*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(a + b*x) + 12*d^2*(b*c - a*d)*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) + 6*B*d^2*(b*c - a*d)*n*Log[c + d*x] + 6*B*d^2*(-(b*c
) + a*d)*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
- 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(4*b^4*g^3)
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2336 vs. 2(338) = 676.
time = 0.72, size = 2336, normalized size = 6.47

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="maxima")
```

```
[Out] 3/4*I*B*c^2*d*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*
d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) +
 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^
3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2
)*g^3)) - 1/4*I*B*c^3*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2
 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b
*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^
3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) + 1/2*I*A*d^3*((6*a^2*b*x + 5*a^3)/(
b^6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*log(b*x +
a)/(b^4*g^3)) - 3/2*I*A*c*d^2*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a*b^4*g^3
*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) + 3/2*I*(2*b*x + a)*B*c^2*d*l
og((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^
2*g^3) + 3/2*I*(2*b*x + a)*A*c^2*d/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g
^3) + 1/2*I*B*c^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^3*g^3*x^2 + 2*a
*b^2*g^3*x + a^2*b*g^3) + 1/2*I*A*c^3/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*
g^3) + 1/2*(2*I*b^3*c^3*d^2*n + 8*I*a*b^2*c^2*d^3*n - 13*I*a^2*b*c*d^4*n +
5*I*a^3*d^5*n)*B*log(d*x + c)/(b^6*c^2*g^3 - 2*a*b^5*c*d*g^3 + a^2*b^4*d^2*
g^3) + 1/4*(4*(-I*b^5*c^2*d^3 + 2*I*a*b^4*c*d^4 - I*a^2*b^3*d^5)*B*x^3 + 8*
(-I*a*b^4*c^2*d^3 + 2*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*B*x^2 + 2*(a^2*b^3*c
^2*d^3*(27*I*n + 28*I) + a^4*b*d^5*(5*I*n + 4*I) + 12*a*b^4*c^3*d^2*(-I*n -
 I) + 20*a^3*b^2*c*d^4*(-I*n - I))*B*x + 6*((I*b^5*c^3*d^2*n - 3*I*a*b^4*c^
2*d^3*n + 3*I*a^2*b^3*c*d^4*n - I*a^3*b^2*d^5*n)*B*x^2 + 2*(I*a*b^4*c^3*d^2
*n - 3*I*a^2*b^3*c^2*d^3*n + 3*I*a^3*b^2*c*d^4*n - I*a^4*b*d^5*n)*B*x + (I*
a^2*b^3*c^3*d^2*n - 3*I*a^3*b^2*c^2*d^3*n + 3*I*a^4*b*c*d^4*n - I*a^5*d^5*n
```

```
)*B)*log(b*x + a)^2 - (a^4*b*c*d^4*(35*I*n + 38*I) - 3*a^2*b^3*c^3*d^2*(-7*
I*n - 6*I) + a^5*d^5*(-9*I*n - 10*I) + a^3*b^2*c^2*d^3*(-47*I*n - 46*I))*B
+ 2*((a^2*b^3*c*d^4*(19*I*n - 18*I) + 2*a*b^4*c^2*d^3*(-7*I*n + 9*I) + a^3*
b^2*d^5*(-7*I*n + 6*I) - 6*I*b^5*c^3*d^2)*B*x^2 + 2*(a^3*b^2*c*d^4*(19*I*n
- 18*I) + 2*a^2*b^3*c^2*d^3*(-7*I*n + 9*I) + a^4*b*d^5*(-7*I*n + 6*I) - 6*I
*a*b^4*c^3*d^2)*B*x + (a^4*b*c*d^4*(19*I*n - 18*I) + 2*a^3*b^2*c^2*d^3*(-7*
I*n + 9*I) + a^5*d^5*(-7*I*n + 6*I) - 6*I*a^2*b^3*c^3*d^2)*B)*log(b*x + a)
+ 2*(2*(-I*b^5*c^2*d^3 + 2*I*a*b^4*c*d^4 - I*a^2*b^3*d^5)*B*x^3 + 4*(-I*a*b
^4*c^2*d^3 + 2*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*B*x^2 + 4*(-3*I*a*b^4*c^3*d
^2 + 7*I*a^2*b^3*c^2*d^3 - 5*I*a^3*b^2*c*d^4 + I*a^4*b*d^5)*B*x + (-9*I*a^2
*b^3*c^3*d^2 + 23*I*a^3*b^2*c^2*d^3 - 19*I*a^4*b*c*d^4 + 5*I*a^5*d^5)*B + 6
*((-I*b^5*c^3*d^2 + 3*I*a*b^4*c^2*d^3 - 3*I*a^2*b^3*c*d^4 + I*a^3*b^2*d^5)*
B*x^2 + 2*(-I*a*b^4*c^3*d^2 + 3*I*a^2*b^3*c^2*d^3 - 3*I*a^3*b^2*c*d^4 + I*a
^4*b*d^5)*B*x + (-I*a^2*b^3*c^3*d^2 + 3*I*a^3*b^2*c^2*d^3 - 3*I*a^4*b*c*d^4
 + I*a^5*d^5)*B)*log(b*x + a))*log((b*x + a)^n) + 2*(2*(I*b^5*c^2*d^3 - 2*I
*a*b^4*c*d^4 + I*a^2*b^3*d^5)*B*x^3 + 4*(I*a*b^4*c^2*d^3 - 2*I*a^2*b^3*c*d^
4 + I*a^3*b^2*d^5)*B*x^2 + 4*(3*I*a*b^4*c^3*d^2 - 7*I*a^2*b^3*c^2*d^3 + 5*I
*a^3*b^2*c*d^4 - I*a^4*b*d^5)*B*x + (9*I*a^2*b^3*c^3*d^2 - 23*I*a^3*b^2*c^2
*d^3 + 19*I*a^4*b*c*d^4 - 5*I*a^5*d^5)*B + 6*((I*b^5*c^3*d^2 - 3*I*a*b^4*c^
2*d^3 + 3*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*B*x^2 + 2*(I*a*b^4*c^3*d^2 - 3*I
*a^2*b^3*c^2*d^3 + 3*I*a^3*b^2*c*d^4 - I*a^4*b*d^5)*B*x + (I*a^2*b^3*c^3*d^
2 - 3*I*a^3*b^2*c^2*d^3 + 3*I*a^4*b*c*d^4 - I*a^5*d^5)*B)*log(b*x + a))*log
((d*x + c)^n))/(a^2*b^6*c^2*g^3 - 2*a^3*b^5*c*d*g^3 + a^4*b^4*d^2*g^3 + (b^
8*c^2*g^3 - 2*a*b^7*c*d*g^3 + a^2*b^6*d^2*g^3)*x^2 + 2*(a*b^7*c^2*g^3 - 2*a
^2*b^6*c*d*g^3 + a^3*b^5*d^2*g^3)*x) - 3*(I*b*c*d^2*n - I*a*d^3*n)*(log(b*x
 + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)
))*B/(b^4*g^3)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="fricas")
```

```
[Out] integral(((-I*A - I*B)*d^3*x^3 - 3*(I*A + I*B)*c*d^2*x^2 - 3*(I*A + I*B)*c^
2*d*x + (-I*A - I*B)*c^3 + (-I*B*d^3*n*x^3 - 3*I*B*c*d^2*n*x^2 - 3*I*B*c^2*
d*n*x - I*B*c^3*n)*log((b*x + a)/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2
 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^{3}\left(\int \frac{Ac^{3}}{a^{3}+3a^{2}bx+3ab^{2}x^{2}+b^{3}x^{3}}\,dx+\int \frac{Ad^{3}x^{3}}{a^{3}+3a^{2}bx+3ab^{2}x^{2}+b^{3}x^{3}}\,dx+\int \frac{Bc^{3}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{a^{3}+3a^{2}bx+3ab^{2}x^{2}+b^{3}x^{3}}\,dx+\int \frac{3Acd^{2}x^{2}}{a^{3}+3a^{2}bx+3ab^{2}x^{2}+b^{3}x^{3}}\,dx+\int \frac{3Ac^{2}dx}{a^{3}+3a^{2}bx+3ab^{2}x^{2}+b^{3}x^{3}}\,dx+\int \frac{Bd^{3}x^{3}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{a^{3}+3a^{2}bx+3ab^{2}x^{2}+b^{3}x^{3}}\,dx+\int \frac{3Bcd^{2}x^{2}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{a^{3}+3a^{2}bx+3ab^{2}x^{2}+b^{3}x^{3}}\,dx+\int \frac{3Bc^{2}dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{a^{3}+3a^{2}bx+3ab^{2}x^{2}+b^{3}x^{3}}\,dx\right)}{g^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3,x)
```

```
[Out] i**3*(Integral(A*c**3/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) +
 Integral(A*d**3*x**3/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) +
 Integral(B*c**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**3 + 3*a**2*b*x
 + 3*a*b**2*x**2 + b**3*x**3), x) + Integral(3*A*c*d**2*x**2/(a**3 + 3*a**2
*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + Integral(3*A*c**2*d*x/(a**3 + 3*a**
2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + Integral(B*d**3*x**3*log(e*(a/(c +
 d*x) + b*x/(c + d*x))**n)/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3),
 x) + Integral(3*B*c*d**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**
3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + Integral(3*B*c**2*d*x*log
(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b
**3*x**3), x))/g**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(b*g*x + a
*g)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{(a\,g+b\,g\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
3,x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
3, x)
```

3.134 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=326

$$-\frac{Bd^2i^3n(c+dx)}{b^3g^4(a+bx)}-\frac{Bdi^3n(c+dx)^2}{4b^2g^4(a+bx)^2}-\frac{Bi^3n(c+dx)^3}{9bg^4(a+bx)^3}-\frac{d^2i^3(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^4(a+bx)}-\frac{di^3(c+dx)^2\,(}{2b^2}$$

```
[Out] -B*d^2*i^3*n*(d*x+c)/b^3/g^4/(b*x+a)-1/4*B*d*i^3*n*(d*x+c)^2/b^2/g^4/(b*x+a
)^2-1/9*B*i^3*n*(d*x+c)^3/b/g^4/(b*x+a)^3-d^2*i^3*(d*x+c)*(A+B*ln(e*((b*x+a
)/(d*x+c))^n))/b^3/g^4/(b*x+a)-1/2*d*i^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+
c))^n))/b^2/g^4/(b*x+a)^2-1/3*i^3*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))
/b/g^4/(b*x+a)^3-d^3*i^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(
b*x+a))/b^4/g^4+B*d^3*i^3*n*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g^4
```

Rubi [A]
time = 0.29, antiderivative size = 326, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.116$, Rules used = {2561, 2380, 2341, 2379, 2438}

$$\frac{Bd^3i^3n\,\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^4}-\frac{d^3i^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^4}-\frac{d^2i^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^4(a+bx)}-\frac{di^3(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g^4(a+bx)^2}-\frac{i^3(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3bg^4(a+bx)^3}-\frac{Bd^2i^3n(c+dx)}{b^3g^4(a+bx)}-\frac{Bdi^3n(c+dx)^2}{4b^2g^4(a+bx)^2}-\frac{Bi^3n(c+dx)^3}{9bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
4,x]
```

```
[Out] -((B*d^2*i^3*n*(c + d*x))/(b^3*g^4*(a + b*x))) - (B*d*i^3*n*(c + d*x)^2)/(4
*b^2*g^4*(a + b*x)^2) - (B*i^3*n*(c + d*x)^3)/(9*b*g^4*(a + b*x)^3) - (d^2*
i^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^4*(a + b*x)) -
 (d*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^4*(a +
 b*x)^2) - (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*g^
4*(a + b*x)^3) - (d^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b
*(c + d*x))/(d*(a + b*x))])/(b^4*g^4) + (B*d^3*i^3*n*PolyLog[2, (b*(c + d*x
))/(d*(a + b*x))])/(b^4*g^4)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
```

```
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(134c+134dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx=\int\left(\frac{2406104(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^4(a+bx)^4}+\frac{721831\ldots}{}\right.$$

$$=\frac{(2406104d^3)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{b^3g^4}+\frac{(7218312d^2(bc-ad\ldots}{}$$

$$=-\frac{2406104(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^4g^4(a+bx)^3}-\frac{3609156d\ldots}{}$$

$$=-\frac{2406104(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^4g^4(a+bx)^3}-\frac{3609156d\ldots}{}$$

$$=-\frac{2406104(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^4g^4(a+bx)^3}-\frac{3609156d\ldots}{}$$

$$=-\frac{2406104B(bc-ad)^3n}{9b^4g^4(a+bx)^3}-\frac{4210682Bd(bc-ad)^2n}{3b^4g^4(a+bx)^2}-\frac{132\ldots}{}$$

$$=-\frac{2406104B(bc-ad)^3n}{9b^4g^4(a+bx)^3}-\frac{4210682Bd(bc-ad)^2n}{3b^4g^4(a+bx)^2}-\frac{132\ldots}{}$$

$$=-\frac{2406104B(bc-ad)^3n}{9b^4g^4(a+bx)^3}-\frac{4210682Bd(bc-ad)^2n}{3b^4g^4(a+bx)^2}-\frac{132\ldots}{}$$

Mathematica [A]
time = 0.31, size = 326, normalized size = 1.00

$$\frac{i^3\left(-\frac{4B(bc-ad)^3n}{(a+bx)^3}-\frac{21Bd(bc-ad)^2n}{(a+bx)^2}+\frac{66Bd^2(-bc+ad)n}{a+bx}-66Bd^3n\log(a+bx)-\frac{12(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)^3}-\frac{54d(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)^2}+\frac{108d^2(-bc+ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx}+36d^3\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+66Bd^3n\log(c+dx)-18Bd^3n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{36b^4g^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^4,x]
```

```
[Out] (i^3*((-4*B*(b*c - a*d)^3*n)/(a + b*x)^3 - (21*B*d*(b*c - a*d)^2*n)/(a + b*
x)^2 + (66*B*d^2*(-(b*c) + a*d)*n)/(a + b*x) - 66*B*d^3*n*Log[a + b*x] - (1
2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^3 - (54*d
*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (108*d
^2*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + 36*d^
3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 66*B*d^3*n*Log[c +
d*x] - 18*B*d^3*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(36*b^4*g^4)
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="maxima")
```

```
[Out] 1/6*I*B*c*d^2*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 -
 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*
d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a
^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^
4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*
c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a
^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*
log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4
)) + 1/18*I*B*c^3*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 -
3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 +
 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a
^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)
*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^
3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*
d^2 - a^3*b*d^3)*g^4)) + 1/12*I*B*c^2*d*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*
a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a
^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2
- 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a
^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3
*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2
- a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^
4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/6*I*A*d^3*((18*a*b^2*x^2
 + 27*a^2*b*x + 11*a^3)/(b^7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a^2*b^5*g^4*x +
a^3*b^4*g^4) + 6*log(b*x + a)/(b^4*g^4)) - 1/6*I*B*d^3*(((18*a*b^2*x^2 + 27
*a^2*b*x + 11*a^3 + 6*(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*log(b*x + a
```

```
))*log((b*x + a)^n) - (18*a*b^2*x^2 + 27*a^2*b*x + 11*a^3 + 6*(b^3*x^3 + 3*
a*b^2*x^2 + 3*a^2*b*x + a^3)*log(b*x + a))*log((d*x + c)^n))/(b^7*g^4*x^3 +
 3*a*b^6*g^4*x^2 + 3*a^2*b^5*g^4*x + a^3*b^4*g^4) + 6*integrate(1/6*(6*b^4*
d*x^4 + 6*b^4*c*x^3 - 11*a^3*b*c*n + 11*a^4*d*n - 18*(a*b^3*c*n - a^2*b^2*d
*n)*x^2 - 27*(a^2*b^2*c*n - a^3*b*d*n)*x - 6*(a^3*b*c*n - a^4*d*n + (b^4*c*
n - a*b^3*d*n)*x^3 + 3*(a*b^3*c*n - a^2*b^2*d*n)*x^2 + 3*(a^2*b^2*c*n - a^3
*b*d*n)*x)*log(b*x + a))/(b^8*d*g^4*x^5 + a^4*b^4*c*g^4 + (b^8*c*g^4 + 4*a*
b^7*d*g^4)*x^4 + 2*(2*a*b^7*c*g^4 + 3*a^2*b^6*d*g^4)*x^3 + 2*(3*a^2*b^6*c*g
^4 + 2*a^3*b^5*d*g^4)*x^2 + (4*a^3*b^5*c*g^4 + a^4*b^4*d*g^4)*x), x)) + 1/2
*I*(3*b*x + a)*B*c^2*d*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^5*g^4*x^3
+ 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + I*(3*b^2*x^2 + 3*a*b*x
 + a^2)*B*c*d^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^6*g^4*x^3 + 3*a*b
^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + 1/2*I*(3*b*x + a)*A*c^2*d/(b^
5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + I*(3*b^2*x^2
 + 3*a*b*x + a^2)*A*c*d^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x
+ a^3*b^3*g^4) + 1/3*I*B*c^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^4*g^
4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 1/3*I*A*c^3/(b^4*g
^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="fricas")
```

```
[Out] integral(((-I*A - I*B)*d^3*x^3 - 3*(I*A + I*B)*c*d^2*x^2 - 3*(I*A + I*B)*c^
2*d*x + (-I*A - I*B)*c^3 + (-I*B*d^3*n*x^3 - 3*I*B*c*d^2*n*x^2 - 3*I*B*c^2*
d*n*x - I*B*c^3*n)*log((b*x + a)/(d*x + c)))/(b^4*g^4*x^4 + 4*a*b^3*g^4*x^3
 + 6*a^2*b^2*g^4*x^2 + 4*a^3*b*g^4*x + a^4*g^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^3\left(\int \frac{Ac^3}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{Ad^3x^3}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{Bc^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{3Acd^2x^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{3Ac^2dx}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{Bd^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{3Bcd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{3Bc^2dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx\right)}{g^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4,x)
```

```
[Out] i**3*(Integral(A*c**3/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3
 + b**4*x**4), x) + Integral(A*d**3*x**3/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x
**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(B*c**3*log(e*(a/(c + d*x) +
 b*x/(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 +
 b**4*x**4), x) + Integral(3*A*c*d**2*x**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2
```

```
*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(3*A*c**2*d*x/(a**4 + 4*a*
*3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(B*d**
3*x**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*
b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(3*B*c*d**2*x**2*log(e
*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 +
4*a*b**3*x**3 + b**4*x**4), x) + Integral(3*B*c**2*d*x*log(e*(a/(c + d*x) +
 b*x/(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 +
 b**4*x**4), x))/g**4
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(b*g*x + a
*g)^4, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)}{(a\,g+b\,g\,x)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
4,x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
4, x)
```

3.135 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=269

$$\frac{g^3(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3di}-\frac{(bc-ad)g^3(a+bx)^2\left(3A+Bn+3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6d^2i}+\frac{(bc-ad)^2g^3(\cdots}{}$$

```
[Out] 1/3*g^3*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d/i-1/6*(-a*d+b*c)*g^3*(b
*x+a)^2*(3*A+B*n+3*B*ln(e*((b*x+a)/(d*x+c))^n))/d^2/i+1/6*(-a*d+b*c)^2*g^3*
(b*x+a)*(6*A+5*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))/d^3/i+1/6*(-a*d+b*c)^3*g^
3*(6*A+11*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/d^4/i
+B*(-a*d+b*c)^3*g^3*n*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i
```

Rubi [A]
time = 0.24, antiderivative size = 269, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 2384, 2354, 2438}

$$\frac{Bg^3n(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i}+\frac{g^3(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+11Bn\right)}{6d^4i}+\frac{g^3(a+bx)(bc-ad)^2\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+5Bn\right)}{6d^3i}-\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{6d^2i}+\frac{g^3(a+bx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3di}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x),
x]
```

```
[Out] (g^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d*i) - ((b*c -
a*d)*g^3*(a + b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d
^2*i) + ((b*c - a*d)^2*g^3*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(6*d^3*i) + ((b*c - a*d)^3*g^3*(6*A + 11*B*n + 6*B*Log[e*((a
+ b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(6*d^4*i) + (B*(b*c -
 a*d)^3*g^3*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
```

```
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{135c+135dx}\,dx = \int \left(\frac{b(bc-ad)^2g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{135d^3}+\frac{(-bc+ad)^3g^3(A}{d^3(135c}\right.$$

$$=\frac{(bg)\int (ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{135d}-\frac{(b(bc-ad)g^2)}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{270d^2}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{B(bc-ad)^2g^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{135d^3}-\frac{(bc}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{B(bc-ad)^2g^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{135d^3}-\frac{(bc}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{bB(bc-ad)^2g^3nx}{162d^3}-\frac{B(bc-ad)g^3n(a+bx}{810d^2}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{bB(bc-ad)^2g^3nx}{162d^3}-\frac{B(bc-ad)g^3n(a+bx}{810d^2}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{bB(bc-ad)^2g^3nx}{162d^3}-\frac{B(bc-ad)g^3n(a+bx}{810d^2}$$

Mathematica [A]

time = 0.20, size = 370, normalized size = 1.38

$$\frac{g^3\left(6Abd(bc-ad)^2x+6Bd(bc-ad)^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3d^2(-bc+ad)(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2d^3(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-6B(bc-ad)^3n\log(c+dx)+B(bc-ad)n(2bd(bc-ad)x-d^2(a+bx)^2-2(bc-ad)^2\log(c+dx))+3B(bc-ad)^2n(bdx+(-bc+ad)\log(c+dx))-6(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(i(c+dx))+3B(bc-ad)^3n\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(i(c+dx))\right)\log(i(c+dx))+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{6d^4i}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x),x]
```

```
[Out] (g^3*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
 - 6*B*(b*c - a*d)^3*n*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x
- d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n*(b*
d*x + (-(b*c) + a*d)*Log[c + d*x]) - 6*(b*c - a*d)^3*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])*Log[i*(c + d*x)] + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a + b*x
))/(-(b*c) + a*d)] - Log[i*(c + d*x)])*Log[i*(c + d*x)] + 2*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])))/(6*d^4*i)
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^3\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 937 vs. 2(250) = 500.
time = 0.56, size = 937, normalized size = 3.48

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] 3*A*a^2*b*g^3*(-I*x/d + I*c*log(d*x + c)/d^2) - 1/6*A*b^3*g^3*(-6*I*c^3*log
(d*x + c)/d^4 + I*(2*d^2*x^3 - 3*c*d*x^2 + 6*c^2*x)/d^3) - 3/2*A*a*b^2*g^3*
(2*I*c^2*log(d*x + c)/d^3 + I*(d*x^2 - 2*c*x)/d^2) - I*A*a^3*g^3*log(I*d*x
+ I*c)/d - (-I*b^3*c^3*g^3*n + 3*I*a*b^2*c^2*d*g^3*n - 3*I*a^2*b*c*d^2*g^3*
n + I*a^3*d^3*g^3*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dil
og(-(b*d*x + a*d)/(b*c - a*d)))*B/d^4 + 1/6*(18*a^2*b*c*d^2*g^3*(I*n + I) +
```

```
 9*a*b^2*c^2*d*g^3*(-3*I*n - 2*I) - b^3*c^3*g^3*(-11*I*n - 6*I) - 6*I*a^3*d
^3*g^3)*B*log(d*x + c)/d^4 + 1/6*(-2*I*B*b^3*d^3*g^3*x^3 + (b^3*c*d^2*g^3*(
I*n + 3*I) + a*b^2*d^3*g^3*(-I*n - 9*I))*B*x^2 - 6*(I*b^3*c^3*g^3*n - 3*I*a
*b^2*c^2*d*g^3*n + 3*I*a^2*b*c*d^2*g^3*n - I*a^3*d^3*g^3*n)*B*log(b*x + a)*
log(d*x + c) - 3*(-I*b^3*c^3*g^3*n + 3*I*a*b^2*c^2*d*g^3*n - 3*I*a^2*b*c*d^
2*g^3*n + I*a^3*d^3*g^3*n)*B*log(d*x + c)^2 - (6*a*b^2*c*d^2*g^3*(-2*I*n -
3*I) - b^3*c^2*d*g^3*(-5*I*n - 6*I) - a^2*b*d^3*g^3*(-7*I*n - 18*I))*B*x +
(-6*I*a*b^2*c^2*d*g^3*n + 15*I*a^2*b*c*d^2*g^3*n - 11*I*a^3*d^3*g^3*n)*B*lo
g(b*x + a) + (-2*I*B*b^3*d^3*g^3*x^3 - 3*(-I*b^3*c*d^2*g^3 + 3*I*a*b^2*d^3*
g^3)*B*x^2 - 6*(I*b^3*c^2*d*g^3 - 3*I*a*b^2*c*d^2*g^3 + 3*I*a^2*b*d^3*g^3)*
B*x - 6*(-I*b^3*c^3*g^3 + 3*I*a*b^2*c^2*d*g^3 - 3*I*a^2*b*c*d^2*g^3 + I*a^3
*d^3*g^3)*B*log(d*x + c))*log((b*x + a)^n) + (2*I*B*b^3*d^3*g^3*x^3 - 3*(I*
b^3*c*d^2*g^3 - 3*I*a*b^2*d^3*g^3)*B*x^2 - 6*(-I*b^3*c^2*d*g^3 + 3*I*a*b^2*
c*d^2*g^3 - 3*I*a^2*b*d^3*g^3)*B*x - 6*(I*b^3*c^3*g^3 - 3*I*a*b^2*c^2*d*g^3
 + 3*I*a^2*b*c*d^2*g^3 - I*a^3*d^3*g^3)*B*log(d*x + c))*log((d*x + c)^n))/d
^4
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] integral(((-I*A - I*B)*b^3*g^3*x^3 - 3*(I*A + I*B)*a*b^2*g^3*x^2 - 3*(I*A +
 I*B)*a^2*b*g^3*x + (-I*A - I*B)*a^3*g^3 + (-I*B*b^3*g^3*n*x^3 - 3*I*B*a*b^
2*g^3*n*x^2 - 3*I*B*a^2*b*g^3*n*x - I*B*a^3*g^3*n)*log((b*x + a)/(d*x + c))
)/(d*x + c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g^3\left(\int \frac{Aa^3}{c+dx}\,dx + \int \frac{Ab^3x^3}{c+dx}\,dx + \int \frac{Ba^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx + \int \frac{3Aab^2x^2}{c+dx}\,dx + \int \frac{3Aa^2bx}{c+dx}\,dx + \int \frac{Bb^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx + \int \frac{3Bab^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx + \int \frac{3Ba^2bx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i),x)
```

```
[Out] g**3*(Integral(A*a**3/(c + d*x), x) + Integral(A*b**3*x**3/(c + d*x), x) +
Integral(B*a**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x) + Int
egral(3*A*a*b**2*x**2/(c + d*x), x) + Integral(3*A*a**2*b*x/(c + d*x), x) +
 Integral(B*b**3*x**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x)
 + Integral(3*B*a*b**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*
x), x) + Integral(3*B*a**2*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c +
 d*x), x))/i
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3849 vs. 2(250) = 500.
time = 188.80, size = 3849, normalized size = 14.31

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] -1/120*(6*(-I*B*b^9*c^6*g^3*n + 6*I*B*a*b^8*c^5*d*g^3*n + 5*(I*b*x + I*a)*B
*b^8*c^6*d*g^3*n/(d*x + c) - 15*I*B*a^2*b^7*c^4*d^2*g^3*n + 30*(-I*b*x - I*
a)*B*a*b^7*c^5*d^2*g^3*n/(d*x + c) - 10*I*(b*x + a)^2*B*b^7*c^6*d^2*g^3*n/(
d*x + c)^2 + 20*I*B*a^3*b^6*c^3*d^3*g^3*n + 75*(I*b*x + I*a)*B*a^2*b^6*c^4*
d^3*g^3*n/(d*x + c) + 60*I*(b*x + a)^2*B*a*b^6*c^5*d^3*g^3*n/(d*x + c)^2 +
10*I*(b*x + a)^3*B*b^6*c^6*d^3*g^3*n/(d*x + c)^3 - 15*I*B*a^4*b^5*c^2*d^4*g
^3*n + 100*(-I*b*x - I*a)*B*a^3*b^5*c^3*d^4*g^3*n/(d*x + c) - 150*I*(b*x +
a)^2*B*a^2*b^5*c^4*d^4*g^3*n/(d*x + c)^2 - 60*I*(b*x + a)^3*B*a*b^5*c^5*d^4
*g^3*n/(d*x + c)^3 + 6*I*B*a^5*b^4*c*d^5*g^3*n + 75*(I*b*x + I*a)*B*a^4*b^4
*c^2*d^5*g^3*n/(d*x + c) + 200*I*(b*x + a)^2*B*a^3*b^4*c^3*d^5*g^3*n/(d*x +
 c)^2 + 150*I*(b*x + a)^3*B*a^2*b^4*c^4*d^5*g^3*n/(d*x + c)^3 - I*B*a^6*b^3
*d^6*g^3*n + 30*(-I*b*x - I*a)*B*a^5*b^3*c*d^6*g^3*n/(d*x + c) - 150*I*(b*x
 + a)^2*B*a^4*b^3*c^2*d^6*g^3*n/(d*x + c)^2 - 200*I*(b*x + a)^3*B*a^3*b^3*c
^3*d^6*g^3*n/(d*x + c)^3 + 5*(I*b*x + I*a)*B*a^6*b^2*d^7*g^3*n/(d*x + c) +
60*I*(b*x + a)^2*B*a^5*b^2*c*d^7*g^3*n/(d*x + c)^2 + 150*I*(b*x + a)^3*B*a^
4*b^2*c^2*d^7*g^3*n/(d*x + c)^3 - 10*I*(b*x + a)^2*B*a^6*b*d^8*g^3*n/(d*x +
 c)^2 - 60*I*(b*x + a)^3*B*a^5*b*c*d^8*g^3*n/(d*x + c)^3 + 10*I*(b*x + a)^3
*B*a^6*d^9*g^3*n/(d*x + c)^3)*log((b*x + a)/(d*x + c))/(b^5*d^4 - 5*(b*x +
a)*b^4*d^5/(d*x + c) + 10*(b*x + a)^2*b^3*d^6/(d*x + c)^2 - 10*(b*x + a)^3*
b^2*d^7/(d*x + c)^3 + 5*(b*x + a)^4*b*d^8/(d*x + c)^4 - (b*x + a)^5*d^9/(d*
x + c)^5) - (5*I*B*b^10*c^6*g^3*n - 30*I*B*a*b^9*c^5*d*g^3*n - 19*(I*b*x +
I*a)*B*b^9*c^6*d*g^3*n/(d*x + c) + 75*I*B*a^2*b^8*c^4*d^2*g^3*n - 114*(-I*b
*x - I*a)*B*a*b^8*c^5*d^2*g^3*n/(d*x + c) + 23*I*(b*x + a)^2*B*b^8*c^6*d^2*
g^3*n/(d*x + c)^2 - 100*I*B*a^3*b^7*c^3*d^3*g^3*n - 285*(I*b*x + I*a)*B*a^2
*b^7*c^4*d^3*g^3*n/(d*x + c) - 138*I*(b*x + a)^2*B*a*b^7*c^5*d^3*g^3*n/(d*x
 + c)^2 - 3*I*(b*x + a)^3*B*b^7*c^6*d^3*g^3*n/(d*x + c)^3 + 75*I*B*a^4*b^6*
c^2*d^4*g^3*n - 380*(-I*b*x - I*a)*B*a^3*b^6*c^3*d^4*g^3*n/(d*x + c) + 345*
I*(b*x + a)^2*B*a^2*b^6*c^4*d^4*g^3*n/(d*x + c)^2 + 18*I*(b*x + a)^3*B*a*b^
6*c^5*d^4*g^3*n/(d*x + c)^3 - 6*I*(b*x + a)^4*B*b^6*c^6*d^4*g^3*n/(d*x + c)
^4 - 30*I*B*a^5*b^5*c*d^5*g^3*n - 285*(I*b*x + I*a)*B*a^4*b^5*c^2*d^5*g^3*n
/(d*x + c) - 460*I*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g^3*n/(d*x + c)^2 - 45*I*(
b*x + a)^3*B*a^2*b^5*c^4*d^5*g^3*n/(d*x + c)^3 + 36*I*(b*x + a)^4*B*a*b^5*c
^5*d^5*g^3*n/(d*x + c)^4 + 5*I*B*a^6*b^4*d^6*g^3*n - 114*(-I*b*x - I*a)*B*a
^5*b^4*c*d^6*g^3*n/(d*x + c) + 345*I*(b*x + a)^2*B*a^4*b^4*c^2*d^6*g^3*n/(d
*x + c)^2 + 60*I*(b*x + a)^3*B*a^3*b^4*c^3*d^6*g^3*n/(d*x + c)^3 - 90*I*(b*
```

```
x + a)^4*B*a^2*b^4*c^4*d^6*g^3*n/(d*x + c)^4 - 19*(I*b*x + I*a)*B*a^6*b^3*d
^7*g^3*n/(d*x + c) - 138*I*(b*x + a)^2*B*a^5*b^3*c*d^7*g^3*n/(d*x + c)^2 -
45*I*(b*x + a)^3*B*a^4*b^3*c^2*d^7*g^3*n/(d*x + c)^3 + 120*I*(b*x + a)^4*B*
a^3*b^3*c^3*d^7*g^3*n/(d*x + c)^4 + 23*I*(b*x + a)^2*B*a^6*b^2*d^8*g^3*n/(d
*x + c)^2 + 18*I*(b*x + a)^3*B*a^5*b^2*c*d^8*g^3*n/(d*x + c)^3 - 90*I*(b*x
+ a)^4*B*a^4*b^2*c^2*d^8*g^3*n/(d*x + c)^4 - 3*I*(b*x + a)^3*B*a^6*b*d^9*g^
3*n/(d*x + c)^3 + 36*I*(b*x + a)^4*B*a^5*b*c*d^9*g^3*n/(d*x + c)^4 - 6*I*(b
*x + a)^4*B*a^6*d^10*g^3*n/(d*x + c)^4 + 6*I*A*b^10*c^6*g^3 + 6*I*B*b^10*c^
6*g^3 - 36*I*A*a*b^9*c^5*d*g^3 - 36*I*B*a*b^9*c^5*d*g^3 - 30*(I*b*x + I*a)*
A*b^9*c^6*d*g^3/(d*x + c) - 30*(I*b*x + I*a)*B*b^9*c^6*d*g^3/(d*x + c) + 90
*I*A*a^2*b^8*c^4*d^2*g^3 + 90*I*B*a^2*b^8*c^4*d^2*g^3 - 180*(-I*b*x - I*a)*
A*a*b^8*c^5*d^2*g^3/(d*x + c) - 180*(-I*b*x - I*a)*B*a*b^8*c^5*d^2*g^3/(d*x
 + c) + 60*I*(b*x + a)^2*A*b^8*c^6*d^2*g^3/(d*x + c)^2 + 60*I*(b*x + a)^2*B
*b^8*c^6*d^2*g^3/(d*x + c)^2 - 120*I*A*a^3*b^7*c^3*d^3*g^3 - 120*I*B*a^3*b^
7*c^3*d^3*g^3 - 450*(I*b*x + I*a)*A*a^2*b^7*c^4*d^3*g^3/(d*x + c) - 450*(I*
b*x + I*a)*B*a^2*b^7*c^4*d^3*g^3/(d*x + c) - 360*I*(b*x + a)^2*A*a*b^7*c^5*
d^3*g^3/(d*x + c)^2 - 360*I*(b*x + a)^2*B*a*b^7*c^5*d^3*g^3/(d*x + c)^2 - 6
0*I*(b*x + a)^3*A*b^7*c^6*d^3*g^3/(d*x + c)^3 - 60*I*(b*x + a)^3*B*b^7*c^6*
d^3*g^3/(d*x + c)^3 + 90*I*A*a^4*b^6*c^2*d^4*g^3 + 90*I*B*a^4*b^6*c^2*d^4*g
^3 - 600*(-I*b*x - I*a)*A*a^3*b^6*c^3*d^4*g^3/(d*x + c) - 600*(-I*b*x - I*a
)*B*a^3*b^6*c^3*d^4*g^3/(d*x + c) + 900*I*(b*x + a)^2*A*a^2*b^6*c^4*d^4*g^3
/(d*x + c)^2 + 900*I*(b*x + a)^2*B*a^2*b^6*c^4*d^4*g^3/(d*x + c)^2 + 360*I*
(b*x + a)^3*A*a*b^6*c^5*d^4*g^3/(d*x + c)^3 + 360*I*(b*x + a)^3*B*a*b^6*c^5
*d^4*g^3/(d*x + c)^3 - 36*I*A*a^5*b^5*c*d^5*g^3 - 36*I*B*a^5*b^5*c*d^5*g^3
- 450*(I*b*x + I*a)*A*a^4*b^5*c^2*d^5*g^3/(d*x + c) - 450*(I*b*x + I*a)*B*a
^4*b^5*c^2*d^5*g^3/(d*x + c) - 1200*I*(b*x + a)^2*A*a^3*b^5*c^3*d^5*g^3/(d*
x + c)^2 - 1200*I*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g^3/(d*x + c)^2 - 900*I*(b*
x + a)^3*A*a^2*b^5*c^4*d^5*g^3/(d*x + c)^3 - 900*I*(b*x + a)^3*B*a^2*b^5*c^
4*d^5*g^3/(d*x + c)^3 + 6*I*A*a^6*b^4*d^6*g^3 + 6*I*B*a^6*b^4*d^6*g^3 - 180
*(-I*b*x - I*a)*A*a^5*b^4*c*d^6*g^3/(d*x + c) - 180*(-I*b*x - I*a)*B*a^5*b^
4*c*d^6*g^3/(d*x + c) + 900*I*(b*x + a)^2*A*a^4*b^4*c^2*d^6*g^3/(d*x + c)^2
 + 900*I*(b*x + a)^2*B*a^4*b^4*c^2*d^6*g^3/(d*x...
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x),
x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x),
 x)
```

3.136 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=211

$$\frac{g^2(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2di}-\frac{(bc-ad)g^2(a+bx)\left(2A+Bn+2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d^2i}-\frac{(bc-ad)^2g^2(2$$

```
[Out] 1/2*g^2*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d/i-1/2*(-a*d+b*c)*g^2*(b
*x+a)*(2*A+B*n+2*B*ln(e*((b*x+a)/(d*x+c))^n))/d^2/i-1/2*(-a*d+b*c)^2*g^2*(2
*A+3*B*n+2*B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/d^3/i-B*(-
a*d+b*c)^2*g^2*n*polylog(2,d*(b*x+a)/b/(d*x+c))/d^3/i
```

Rubi [A]
time = 0.17, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 2384, 2354, 2438}

$$-\frac{Bg^2n(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}-\frac{g^2(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+3Bn\right)}{2d^3i}-\frac{g^2(a+bx)(bc-ad)\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+Bn\right)}{2d^2i}+\frac{g^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2di}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x),
x]
```

```
[Out] (g^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i) - ((b*c -
a*d)*g^2*(a + b*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2
*i) - ((b*c - a*d)^2*g^2*(2*A + 3*B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[(b*c - a*d)/(b*(c + d*x))])/(2*d^3*i) - (B*(b*c - a*d)^2*g^2*n*PolyLog
[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{136c+136dx}\,dx = \int \left(-\frac{b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{136d^2}+\frac{(bc-ad)^2g^2\left(A+\right.}{d^2(136c}\right.$$

$$=\frac{(bg)\int(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{136d}-\frac{(b(bc-ad)g^2)\int}{}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}+\frac{g^2(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{272d}+\frac{(bc}{}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{136d^2}+\frac{g^2(}{}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{136d^2}+\frac{g^2(}{}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{bB(bc-ad)g^2nx}{272d^2}-\frac{B(bc-ad)g^2(a+bx)}{136d^2}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{bB(bc-ad)g^2nx}{272d^2}-\frac{B(bc-ad)g^2(a+bx)}{136d^2}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{bB(bc-ad)g^2nx}{272d^2}-\frac{B(bc-ad)g^2(a+bx)}{136d^2}$$

Mathematica [A]

time = 0.13, size = 266, normalized size = 1.26

$$\frac{g^2\left(-2Abd(bc-ad)x+2Bd(-bc+ad)(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+d^2(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2B(bc-ad)^2n\log(c+dx)-B(bc-ad)n(bdx+(-bc+ad)\log(c+dx))+2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(i(c+dx))-B(bc-ad)^2n\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(i(c+dx))\right)\log(i(c+dx))+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{2d^3i}$$

Antiderivative was successfully verified.

[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x),x]

[Out] (g^2*(-2*A*b*d*(b*c - a*d)*x + 2*B*d*(-(b*c) + a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*B*(b*c - a*d)^2*n*Log[c + d*x] - B*(b*c - a*d)*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[i*(c + d*x)] - B*(b*c - a*d)^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[i*(c + d*x)])*Log[i*(c + d*x)] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(2*d^3*i)

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)

[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 590 vs. 2(195) = 390.
time = 0.56, size = 590, normalized size = 2.80

$$2\,Aabg^2\left(-\frac{ix}{d}+\frac{ic\log(dx+c)}{d^2}\right)-\frac{1}{2}\,Ab^2g^2\left(\frac{2ic^2\log(dx+c)}{d^3}+\frac{i(dx^2-2cx)}{d^2}\right)-\frac{iAa^2g^2\log(idx+ic)}{d}-\frac{i(b^2c^2g^2n-2abcdg^2n+a^2d^2g^2n)\left(\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{d^3}-\frac{i(b^2c^2g^2(3n+2)-4abcdg^2(n+1)+2a^2d^2g^2)B\log(dx+c)}{2d^3}+\frac{-iBb^2d^2g^2x^2-2(-ib^2c^2g^2n+2iabcdg^2n-ia^2d^2g^2n)B\log(bx+a)\log(dx+c)+(-ib^2c^2g^2n+2iabcdg^2n-ia^2d^2g^2n)B\log(dx+c)^2+(b^2cdg^2(in+2i)+abd^2g^2(-in-4i))Bx+(2iabcdg^2n-3ia^2d^2g^2n)B\log(bx+a)+(-iBb^2d^2g^2x^2-2(-ib^2cdg^2+2iabd^2g^2)Bx-2(ib^2c^2g^2-2iabcdg^2+ia^2d^2g^2)B\log(dx+c))\log((bx+a)^n)+(iBb^2d^2g^2x^2-2(ib^2cdg^2-2iabd^2g^2)Bx-2(-ib^2c^2g^2+2iabcdg^2-ia^2d^2g^2)B\log(dx+c))\log((dx+c)^n)}{2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="maxima")

[Out] 2*A*a*b*g^2*(-I*x/d + I*c*log(d*x + c)/d^2) - 1/2*A*b^2*g^2*(2*I*c^2*log(d*x + c)/d^3 + I*(d*x^2 - 2*c*x)/d^2) - I*A*a^2*g^2*log(I*d*x + I*c)/d - I*(b^2*c^2*g^2*n - 2*a*b*c*d*g^2*n + a^2*d^2*g^2*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/d^3 - 1/2*I*(b^2*c^2*g^2*(3*n + 2) - 4*a*b*c*d*g^2*(n + 1) + 2*a^2*d^2*g^2)*B*log(d*x + c)/d^3 + 1/2*(-I*B*b^2*d^2*g^2*x^2 - 2*(-I*b^2*c^2*g^2*n + 2*I*a*b*c*d*g^2*n - I*a^2*d^2*g^2*n)*B*log(b*x + a)*log(d*x + c) + (-I*b^2*c^2*g^2*n + 2*I*a*b*c*d*g^2*n - I*a^2*d^2*g^2*n)*B*log(d*x + c)^2 + (b^2*c*d*g^2*(I*n + 2*I) + a*b*d^2*g^2*(-I*n - 4*I))*B*x + (2*I*a*b*c*d*g^2*n - 3*I*a^2*d^2*g^2*n)*B*log(b*x + a) + (-I*B*b^2*d^2*g^2*x^2 - 2*(-I*b^2*c*d*g^2 + 2*I*a*b*d^2*g^2)*B*x - 2*(I*b^2*c^2*g^2 - 2*I*a*b*c*d*g^2 + I*a^2*d^2*g^2)*B*log(d*x + c))*log((b*x + a)^n) + (I*B*b^2*d^2*g^2*x^2 - 2*(I*b^2*c*d*g^2 - 2*I*a*b*d^2*g^2)*B*x - 2*(-I*b^2*c^2*g^2 + 2*I*a*b*c*d*g^2 - I*a^2*d^2*g^2)*B*log(d*x + c))*log((d*x + c)^n))/d^3

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] integral(((-I*A - I*B)*b^2*g^2*x^2 - 2*(I*A + I*B)*a*b*g^2*x + (-I*A - I*B)
*a^2*g^2 + (-I*B*b^2*g^2*n*x^2 - 2*I*B*a*b*g^2*n*x - I*B*a^2*g^2*n)*log((b*
x + a)/(d*x + c)))/(d*x + c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g^2\left(\int \frac{Aa^2}{c+dx}\,dx+\int \frac{Ab^2x^2}{c+dx}\,dx+\int \frac{Ba^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx+\int \frac{2Aabx}{c+dx}\,dx+\int \frac{Bb^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx+\int \frac{2Babx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i),x)
```

```
[Out] g**2*(Integral(A*a**2/(c + d*x), x) + Integral(A*b**2*x**2/(c + d*x), x) +
Integral(B*a**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x) + Int
egral(2*A*a*b*x/(c + d*x), x) + Integral(B*b**2*x**2*log(e*(a/(c + d*x) + b
*x/(c + d*x))**n)/(c + d*x), x) + Integral(2*B*a*b*x*log(e*(a/(c + d*x) + b
*x/(c + d*x))**n)/(c + d*x), x))/i
```

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2524 vs. 2(195) = 390.
time = 123.83, size = 2524, normalized size = 11.96

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] 1/24*(2*(-I*B*b^7*c^5*g^2*n + 5*I*B*a*b^6*c^4*d*g^2*n - 4*(-I*b*x - I*a)*B*
b^6*c^5*d*g^2*n/(d*x + c) - 10*I*B*a^2*b^5*c^3*d^2*g^2*n - 20*(I*b*x + I*a)
*B*a*b^5*c^4*d^2*g^2*n/(d*x + c) - 6*I*(b*x + a)^2*B*b^5*c^5*d^2*g^2*n/(d*x
 + c)^2 + 10*I*B*a^3*b^4*c^2*d^3*g^2*n - 40*(-I*b*x - I*a)*B*a^2*b^4*c^3*d^
3*g^2*n/(d*x + c) + 30*I*(b*x + a)^2*B*a*b^4*c^4*d^3*g^2*n/(d*x + c)^2 - 5*
I*B*a^4*b^3*c*d^4*g^2*n - 40*(I*b*x + I*a)*B*a^3*b^3*c^2*d^4*g^2*n/(d*x + c
) - 60*I*(b*x + a)^2*B*a^2*b^3*c^3*d^4*g^2*n/(d*x + c)^2 + I*B*a^5*b^2*d^5*
```

g^2*n - 20*(-I*b*x - I*a)*B*a^4*b^2*c*d^5*g^2*n/(d*x + c) + 60*I*(b*x + a)^
2*B*a^3*b^2*c^2*d^5*g^2*n/(d*x + c)^2 - 4*(I*b*x + I*a)*B*a^5*b*d^6*g^2*n/(
d*x + c) - 30*I*(b*x + a)^2*B*a^4*b*c*d^6*g^2*n/(d*x + c)^2 + 6*I*(b*x + a)
^2*B*a^5*d^7*g^2*n/(d*x + c)^2)*log((b*x + a)/(d*x + c))/(b^4*d^3 - 4*(b*x
+ a)*b^3*d^4/(d*x + c) + 6*(b*x + a)^2*b^2*d^5/(d*x + c)^2 - 4*(b*x + a)^3*
b*d^6/(d*x + c)^3 + (b*x + a)^4*d^7/(d*x + c)^4) + (-I*B*b^8*c^5*g^2*n + 5*
I*B*a*b^7*c^4*d*g^2*n - 2*(-I*b*x - I*a)*B*b^7*c^5*d*g^2*n/(d*x + c) - 10*I
*B*a^2*b^6*c^3*d^2*g^2*n - 10*(I*b*x + I*a)*B*a*b^6*c^4*d^2*g^2*n/(d*x + c)
 + I*(b*x + a)^2*B*b^6*c^5*d^2*g^2*n/(d*x + c)^2 + 10*I*B*a^3*b^5*c^2*d^3*g
^2*n - 20*(-I*b*x - I*a)*B*a^2*b^5*c^3*d^3*g^2*n/(d*x + c) - 5*I*(b*x + a)^
2*B*a*b^5*c^4*d^3*g^2*n/(d*x + c)^2 - 2*I*(b*x + a)^3*B*b^5*c^5*d^3*g^2*n/(
d*x + c)^3 - 5*I*B*a^4*b^4*c*d^4*g^2*n - 20*(I*b*x + I*a)*B*a^3*b^4*c^2*d^4
*g^2*n/(d*x + c) + 10*I*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^2*n/(d*x + c)^2 + 1
0*I*(b*x + a)^3*B*a*b^4*c^4*d^4*g^2*n/(d*x + c)^3 + I*B*a^5*b^3*d^5*g^2*n -
 10*(-I*b*x - I*a)*B*a^4*b^3*c*d^5*g^2*n/(d*x + c) - 10*I*(b*x + a)^2*B*a^3
*b^3*c^2*d^5*g^2*n/(d*x + c)^2 - 20*I*(b*x + a)^3*B*a^2*b^3*c^3*d^5*g^2*n/(
d*x + c)^3 - 2*(I*b*x + I*a)*B*a^5*b^2*d^6*g^2*n/(d*x + c) + 5*I*(b*x + a)^
2*B*a^4*b^2*c*d^6*g^2*n/(d*x + c)^2 + 20*I*(b*x + a)^3*B*a^3*b^2*c^2*d^6*g^
2*n/(d*x + c)^3 - I*(b*x + a)^2*B*a^5*b*d^7*g^2*n/(d*x + c)^2 - 10*I*(b*x +
 a)^3*B*a^4*b*c*d^7*g^2*n/(d*x + c)^3 + 2*I*(b*x + a)^3*B*a^5*d^8*g^2*n/(d*
x + c)^3 - 2*I*A*b^8*c^5*g^2 - 2*I*B*b^8*c^5*g^2 + 10*I*A*a*b^7*c^4*d*g^2 +
 10*I*B*a*b^7*c^4*d*g^2 - 8*(-I*b*x - I*a)*A*b^7*c^5*d*g^2/(d*x + c) - 8*(-
I*b*x - I*a)*B*b^7*c^5*d*g^2/(d*x + c) - 20*I*A*a^2*b^6*c^3*d^2*g^2 - 20*I*
B*a^2*b^6*c^3*d^2*g^2 - 40*(I*b*x + I*a)*A*a*b^6*c^4*d^2*g^2/(d*x + c) - 40
*(I*b*x + I*a)*B*a*b^6*c^4*d^2*g^2/(d*x + c) - 12*I*(b*x + a)^2*A*b^6*c^5*d
^2*g^2/(d*x + c)^2 - 12*I*(b*x + a)^2*B*b^6*c^5*d^2*g^2/(d*x + c)^2 + 20*I*
A*a^3*b^5*c^2*d^3*g^2 + 20*I*B*a^3*b^5*c^2*d^3*g^2 - 80*(-I*b*x - I*a)*A*a^
2*b^5*c^3*d^3*g^2/(d*x + c) - 80*(-I*b*x - I*a)*B*a^2*b^5*c^3*d^3*g^2/(d*x
+ c) + 60*I*(b*x + a)^2*A*a*b^5*c^4*d^3*g^2/(d*x + c)^2 + 60*I*(b*x + a)^2*
B*a*b^5*c^4*d^3*g^2/(d*x + c)^2 - 10*I*A*a^4*b^4*c*d^4*g^2 - 10*I*B*a^4*b^4
*c*d^4*g^2 - 80*(I*b*x + I*a)*A*a^3*b^4*c^2*d^4*g^2/(d*x + c) - 80*(I*b*x +
 I*a)*B*a^3*b^4*c^2*d^4*g^2/(d*x + c) - 120*I*(b*x + a)^2*A*a^2*b^4*c^3*d^4
*g^2/(d*x + c)^2 - 120*I*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^2/(d*x + c)^2 + 2*
I*A*a^5*b^3*d^5*g^2 + 2*I*B*a^5*b^3*d^5*g^2 - 40*(-I*b*x - I*a)*A*a^4*b^3*c
*d^5*g^2/(d*x + c) - 40*(-I*b*x - I*a)*B*a^4*b^3*c*d^5*g^2/(d*x + c) + 120*
I*(b*x + a)^2*A*a^3*b^3*c^2*d^5*g^2/(d*x + c)^2 + 120*I*(b*x + a)^2*B*a^3*b
^3*c^2*d^5*g^2/(d*x + c)^2 - 8*(I*b*x + I*a)*A*a^5*b^2*d^6*g^2/(d*x + c) -
8*(I*b*x + I*a)*B*a^5*b^2*d^6*g^2/(d*x + c) - 60*I*(b*x + a)^2*A*a^4*b^2*c*
d^6*g^2/(d*x + c)^2 - 60*I*(b*x + a)^2*B*a^4*b^2*c*d^6*g^2/(d*x + c)^2 + 12
I(b*x + a)^2*A*a^5*b*d^7*g^2/(d*x + c)^2 + 12*I*(b*x + a)^2*B*a^5*b*d^7*g
^2/(d*x + c)^2)/(b^5*d^3 - 4*(b*x + a)*b^4*d^4/(d*x + c) + 6*(b*x + a)^2*b^
3*d^5/(d*x + c)^2 - 4*(b*x + a)^3*b^2*d^6/(d*x + c)^3 + (b*x + a)^4*b*d^7/(
d*x + c)^4) + 2*(-I*B*b^5*c^5*g^2*n + 5*I*B*a*b^4*c^4*d*g^2*n - 10*I*B*a^2*
b^3*c^3*d^2*g^2*n + 10*I*B*a^3*b^2*c^2*d^3*g^2*n - 5*I*B*a^4*b*c*d^4*g^2*n
+ I*B*a^5*d^5*g^2*n)*log(-b + (b*x + a)*d/(d*x + c))/(b^2*d^3) + 2*(I*B*b^5

```
*c^5*g^2*n - 5*I*B*a*b^4*c^4*d*g^2*n + 10*I*B*a^2*b^3*c^3*d^2*g^2*n - 10*I*
B*a^3*b^2*c^2*d^3*g^2*n + 5*I*B*a^4*b*c*d^4*g^2*n - I*B*a^5*d^5*g^2*n)*log(
(b*x + a)/(d*x + c))/(b^2*d^3))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)^2
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^2\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x),
x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x),
 x)
```

3.137 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=134

$$\frac{g(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{di}+\frac{(bc-ad)g\left(A+Bn+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)}{d^2i}+\frac{B(bc-ad)gn\mathrm{L}}{d^2i}$$

```
[Out] g*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d/i+(-a*d+b*c)*g*(A+B*n+B*ln(e*((
b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/d^2/i+B*(-a*d+b*c)*g*n*polylog
(2,d*(b*x+a)/b/(d*x+c))/d^2/i
```

Rubi [A]

time = 0.10, antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$, Rules used = {2561, 2384, 2354, 2438}

$$\frac{Bgn(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}+\frac{g(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A+Bn\right)}{d^2i}+\frac{g(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x),x]
```

```
[Out] (g*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d*i) + ((b*c - a*d)*g
*(A + B*n + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))
])/(d^2*i) + (B*(b*c - a*d)*g*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d
^2*i)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{137c+137dx}\,dx = \int \left(\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{137d}+\frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{137d(c+dx)}\right.$$

$$=\frac{(bg)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{137d}-\frac{((bc-ad)g)\int\frac{A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.}{c+dx}}{137d}$$

$$=\frac{Abgx}{137d}-\frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)}{137d^2}+\frac{(bBg)}{}$$

$$=\frac{Abgx}{137d}+\frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d}-\frac{(bc-ad)g\left(A+B\log\left(e\left(\right.\right.\right.}{137d^2}$$

$$=\frac{Abgx}{137d}+\frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d}-\frac{B(bc-ad)gn\log(c+dx)}{137d^2}$$

$$=\frac{Abgx}{137d}+\frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d}-\frac{B(bc-ad)gn\log(c+dx)}{137d^2}$$

$$=\frac{Abgx}{137d}+\frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d}-\frac{B(bc-ad)gn\log(c+dx)}{137d^2}$$

$$=\frac{Abgx}{137d}+\frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d}-\frac{B(bc-ad)gn\log(c+dx)}{137d^2}$$

Mathematica [A]
time = 0.08, size = 170, normalized size = 1.27

$$\frac{g\left(2Abdx+2Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-2B(bc-ad)n\log(c+dx)-2(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)+B(bc-ad)n\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{2d^2i}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i
*x),x]
```

```
[Out] (g*(2*A*b*d*x + 2*B*d*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 2*B*(b*c -
 a*d)*n*Log[c + d*x] - 2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[c + d*x] + B*(b*c - a*d)*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(2*d^2
*i)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 289 vs. 2(129) = 258.
time = 0.56, size = 289, normalized size = 2.16

$$Abg\left(-\frac{ix}{d}+\frac{ic\log(dx+c)}{d^2}\right)-\frac{iAag\log(idx+ic)}{d}-\frac{(-ibcgn+iadgn)\left(\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{d^2}-\frac{(bcg(-in-i)+iadg)B\log(dx+c)}{d^2}+\frac{-2iBadgn\log(bx+a)-2iBbdgx-2(ibcgn-iadgn)B\log(bx+a)\log(dx+c)+(ibcgn-iadgn)B\log(dx+c)^2-2(iBbdgx+(-ibcg+iadg)B\log(dx+c))\log((bx+a)^n)-2(-iBbdgx+(ibcg-iadg)B\log(dx+c))\log((dx+c)^n)}{2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] A*b*g*(-I*x/d + I*c*log(d*x + c)/d^2) - I*A*a*g*log(I*d*x + I*c)/d - (-I*b*
c*g*n + I*a*d*g*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog
(-(b*d*x + a*d)/(b*c - a*d)))*B/d^2 - (b*c*g*(-I*n - I) + I*a*d*g)*B*log(d*
x + c)/d^2 + 1/2*(-2*I*B*a*d*g*n*log(b*x + a) - 2*I*B*b*d*g*x - 2*(I*b*c*g*
n - I*a*d*g*n)*B*log(b*x + a)*log(d*x + c) + (I*b*c*g*n - I*a*d*g*n)*B*log(
d*x + c)^2 - 2*(I*B*b*d*g*x + (-I*b*c*g + I*a*d*g)*B*log(d*x + c))*log((b*x
 + a)^n) - 2*(-I*B*b*d*g*x + (I*b*c*g - I*a*d*g)*B*log(d*x + c))*log((d*x +
 c)^n))/d^2
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] integral(((-I*A - I*B)*b*g*x + (-I*A - I*B)*a*g + (-I*B*b*g*n*x - I*B*a*g*n
)*log((b*x + a)/(d*x + c)))/(d*x + c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g\left(\int \frac{Aa}{c+dx}\,dx+\int \frac{Abx}{c+dx}\,dx+\int \frac{Ba\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{c+dx}\,dx+\int \frac{Bbx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i),x)
```

```
[Out] g*(Integral(A*a/(c + d*x), x) + Integral(A*b*x/(c + d*x), x) + Integral(B*a
*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x) + Integral(B*b*x*log
(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x))/i
```

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1279 vs. 2(129) = 258.
time = 75.17, size = 1279, normalized size = 9.54

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] -1/6*((-I*B*b^5*c^4*g*n + 4*I*B*a*b^4*c^3*d*g*n - 3*(-I*b*x - I*a)*B*b^4*c^
4*d*g*n/(d*x + c) - 6*I*B*a^2*b^3*c^2*d^2*g*n - 12*(I*b*x + I*a)*B*a*b^3*c^
3*d^2*g*n/(d*x + c) + 4*I*B*a^3*b^2*c*d^3*g*n - 18*(-I*b*x - I*a)*B*a^2*b^2
*c^2*d^3*g*n/(d*x + c) - I*B*a^4*b*d^4*g*n - 12*(I*b*x + I*a)*B*a^3*b*c*d^4
*g*n/(d*x + c) - 3*(-I*b*x - I*a)*B*a^4*d^5*g*n/(d*x + c))*log((b*x + a)/(d
*x + c))/(b^3*d^2 - 3*(b*x + a)*b^2*d^3/(d*x + c) + 3*(b*x + a)^2*b*d^4/(d*
x + c)^2 - (b*x + a)^3*d^5/(d*x + c)^3) + ((-I*b*x - I*a)*B*b^5*c^4*d*g*n/(
d*x + c) - 4*(-I*b*x - I*a)*B*a*b^4*c^3*d^2*g*n/(d*x + c) + I*(b*x + a)^2*B
*b^4*c^4*d^2*g*n/(d*x + c)^2 - 6*(I*b*x + I*a)*B*a^2*b^3*c^2*d^3*g*n/(d*x +
 c) - 4*I*(b*x + a)^2*B*a*b^3*c^3*d^3*g*n/(d*x + c)^2 - 4*(-I*b*x - I*a)*B*
a^3*b^2*c*d^4*g*n/(d*x + c) + 6*I*(b*x + a)^2*B*a^2*b^2*c^2*d^4*g*n/(d*x +
c)^2 + (-I*b*x - I*a)*B*a^4*b*d^5*g*n/(d*x + c) - 4*I*(b*x + a)^2*B*a^3*b*c
*d^5*g*n/(d*x + c)^2 + I*(b*x + a)^2*B*a^4*d^6*g*n/(d*x + c)^2 - I*A*b^6*c^
4*g - I*B*b^6*c^4*g + 4*I*A*a*b^5*c^3*d*g + 4*I*B*a*b^5*c^3*d*g - 3*(-I*b*x
 - I*a)*A*b^5*c^4*d*g/(d*x + c) - 3*(-I*b*x - I*a)*B*b^5*c^4*d*g/(d*x + c)
- 6*I*A*a^2*b^4*c^2*d^2*g - 6*I*B*a^2*b^4*c^2*d^2*g - 12*(I*b*x + I*a)*A*a*
b^4*c^3*d^2*g/(d*x + c) - 12*(I*b*x + I*a)*B*a*b^4*c^3*d^2*g/(d*x + c) + 4*
I*A*a^3*b^3*c*d^3*g + 4*I*B*a^3*b^3*c*d^3*g - 18*(-I*b*x - I*a)*A*a^2*b^3*c
^2*d^3*g/(d*x + c) - 18*(-I*b*x - I*a)*B*a^2*b^3*c^2*d^3*g/(d*x + c) - I*A*
a^4*b^2*d^4*g - I*B*a^4*b^2*d^4*g - 12*(I*b*x + I*a)*A*a^3*b^2*c*d^4*g/(d*x
 + c) - 12*(I*b*x + I*a)*B*a^3*b^2*c*d^4*g/(d*x + c) - 3*(-I*b*x - I*a)*A*a
```

```
^4*b*d^5*g/(d*x + c) - 3*(-I*b*x - I*a)*B*a^4*b*d^5*g/(d*x + c))/(b^4*d^2 -
 3*(b*x + a)*b^3*d^3/(d*x + c) + 3*(b*x + a)^2*b^2*d^4/(d*x + c)^2 - (b*x +
 a)^3*b*d^5/(d*x + c)^3) - (I*B*b^4*c^4*g*n - 4*I*B*a*b^3*c^3*d*g*n + 6*I*B
*a^2*b^2*c^2*d^2*g*n - 4*I*B*a^3*b*c*d^3*g*n + I*B*a^4*d^4*g*n)*log(b - (b*
x + a)*d/(d*x + c))/(b^2*d^2) - (-I*B*b^4*c^4*g*n + 4*I*B*a*b^3*c^3*d*g*n -
 6*I*B*a^2*b^2*c^2*d^2*g*n + 4*I*B*a^3*b*c*d^3*g*n - I*B*a^4*d^4*g*n)*log((
b*x + a)/(d*x + c))/(b^2*d^2))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)^2
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a\,g+b\,g\,x)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x),x)
[Out] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x), x
)
```

3.138 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ci+dix}\,dx$

Optimal. Leaf size=80

$$-\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)}{di}-\frac{Bn\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)}{di}$$

```
[Out] -(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/d/i-B*n*polylog(2
,d*(b*x+a)/b/(d*x+c))/d/i
```

Rubi [A]

time = 0.15, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {2543, 2458, 2378, 2370, 2352}

$$-\frac{Bn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{di}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x),x]
```

```
[Out] -(((A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(
d*i)) - (B*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d*i)
```

Rule 2352

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[(-e^(-1))*PolyLo
g[2, 1 - c*x], x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2370

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2378

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2458

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
```

```
[(g*(x/e))^q*((e*h - d*i)/e + i*(x/e))^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2543

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))/((f_.) + (g_.)*(x_)), x_Symbol] :> Simp[(-Log[(b*c - a*d)/(b*(c + d*x
))])*((A + B*Log[e*((a + b*x)/(c + d*x))^n])/g), x] + Dist[B*n*((b*c - a*d)
/g), Int[Log[(b*c - a*d)/(b*(c + d*x))]/((a + b*x)*(c + d*x)), x], x] /; Fr
eeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c - a*d, 0] && EqQ[d*f - c*
g, 0]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{138c+138dx}\,dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c+138dx)}{138d} - \frac{(Bn)\int\frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\log(}{a+bx}}{138d}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c+138dx)}{138d} - \frac{(Bn)\int\left(\frac{b\log(138c+138dx)}{a+bx}-\frac{d\log(}{}\right.}{138d}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c+138dx)}{138d} + \frac{1}{138}(Bn)\int\frac{\log(138c+138dx)}{c+dx}$$

$$= -\frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(138c+138dx)}{138d} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c}{138d}$$

$$= -\frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(138c+138dx)}{138d} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c}{138d}$$

$$= \frac{Bn\log^2(138(c+dx))}{276d} - \frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(138c+138dx)}{138d} + \frac{(A+B\log}{}$$

Mathematica [A]
time = 0.02, size = 101, normalized size = 1.26

$$\frac{\log(i(c+dx))\left(2A-2Bn\log\left(\frac{d(a+bx)}{-bc+ad}\right)+2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn\log(i(c+dx))\right)-2Bn\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)}{2di}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x),x]
```

[Out] (Log[i*(c + d*x)]*(2*A - 2*B*n*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*B*Log[
e*((a + b*x)/(c + d*x))^n] + B*n*Log[i*(c + d*x)]) - 2*B*n*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])/(2*d*i)

Maple [**F**]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{dix + ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)

[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="maxima
")

[Out] 1/2*B*((2*I*n*log(b*x + a)*log(d*x + c) - I*n*log(d*x + c)^2 - 2*I*log(d*x
+ c)*log((b*x + a)^n) + 2*I*log(d*x + c)*log((d*x + c)^n))/d - 2*integrate(
(I*n*log(b*x + a) + I)/(d*x + c), x)) - I*A*log(I*d*x + I*c)/d

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="fricas
")

[Out] integral((-I*B*n*log((b*x + a)/(d*x + c)) - I*A - I*B)/(d*x + c), x)

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A}{c+dx}\,dx + \int \frac{B\log\left(e\left(\frac{a}{c+dx} + \frac{bx}{c+dx}\right)^{n}\right)}{c+dx}\,dx}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i),x)
```

```
[Out] (Integral(A/(c + d*x), x) + Integral(B*log(e*(a/(c + d*x) + b*x/(c + d*x))*
*n)/(c + d*x), x))/i
```

Giac [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 563 vs. $2(74) = 148$.
time = 52.91, size = 563, normalized size = 7.04

$$-\frac{1}{2}\left(\frac{\left(iBb^3c^3n-3iBab^2c^2dn+3iBa^2bcd^2n-iBa^3d^3n\right)\log\left(\frac{bx+a}{dx+c}\right)}{b^2d-\frac{2(bx+a)bd^2}{dx+c}+\frac{(bx+a)^2d^3}{(dx+c)^2}}+\frac{-iBb^4c^3n+3iBab^3c^2dn+\frac{(ibx+ia)Bb^3c^3dn}{dx+c}-3iBa^2b^2cd^2n-\frac{3(ibx+ia)Bab^2c^2d^2n}{dx+c}+iBa^3bd^3n-\frac{3(-ibx-ia)Ba^2bcd^3n}{dx+c}+\frac{(-ibx-ia)Ba^3d^4n}{dx+c}+iAb^4c^3+iBb^4c^3-3iAab^3c^2d-3iBab^3c^2d+3iAa^2b^2cd^2+3iBa^2b^2cd^2-iAa^3bd^3-iBa^3bd^3}{b^3d-\frac{2(bx+a)b^2d^2}{dx+c}+\frac{(bx+a)^2bd^3}{(dx+c)^2}}-\frac{\left(-iBb^3c^3n+3iBab^2c^2dn-3iBa^2bcd^2n+iBa^3d^3n\right)\log\left(-b+\frac{(bx+a)d}{dx+c}\right)}{b^2d}-\frac{\left(iBb^3c^3n-3iBab^2c^2dn+3iBa^2bcd^2n-iBa^3d^3n\right)\log\left(\frac{bx+a}{dx+c}\right)}{b^2d}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] -1/2*((I*B*b^3*c^3*n - 3*I*B*a*b^2*c^2*d*n + 3*I*B*a^2*b*c*d^2*n - I*B*a^3*
d^3*n)*log((b*x + a)/(d*x + c))/(b^2*d - 2*(b*x + a)*b*d^2/(d*x + c) + (b*x
 + a)^2*d^3/(d*x + c)^2) + (-I*B*b^4*c^3*n + 3*I*B*a*b^3*c^2*d*n + (I*b*x +
 I*a)*B*b^3*c^3*d*n/(d*x + c) - 3*I*B*a^2*b^2*c*d^2*n - 3*(I*b*x + I*a)*B*a
*b^2*c^2*d^2*n/(d*x + c) + I*B*a^3*b*d^3*n - 3*(-I*b*x - I*a)*B*a^2*b*c*d^3
*n/(d*x + c) + (-I*b*x - I*a)*B*a^3*d^4*n/(d*x + c) + I*A*b^4*c^3 + I*B*b^4
*c^3 - 3*I*A*a*b^3*c^2*d - 3*I*B*a*b^3*c^2*d + 3*I*A*a^2*b^2*c*d^2 + 3*I*B*
a^2*b^2*c*d^2 - I*A*a^3*b*d^3 - I*B*a^3*b*d^3)/(b^3*d - 2*(b*x + a)*b^2*d^2
/(d*x + c) + (b*x + a)^2*b*d^3/(d*x + c)^2) - (-I*B*b^3*c^3*n + 3*I*B*a*b^2
*c^2*d*n - 3*I*B*a^2*b*c*d^2*n + I*B*a^3*d^3*n)*log(-b + (b*x + a)*d/(d*x +
 c))/(b^2*d) - (I*B*b^3*c^3*n - 3*I*B*a*b^2*c^2*d*n + 3*I*B*a^2*b*c*d^2*n -
 I*B*a^3*d^3*n)*log((b*x + a)/(d*x + c))/(b^2*d))*(b*c/(b*c - a*d)^2 - a*d/
(b*c - a*d)^2)^2
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{c\,i+d\,i\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(c*i + d*i*x),x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(c*i + d*i*x), x)
```

3.139 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)}\,dx$

Optimal. Leaf size=50

$$\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2B(bc-ad)gin}$$

```
[Out] 1/2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/B/(-a*d+b*c)/g/i/n
```

Rubi [A]
time = 0.08, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.047$, Rules used = {2561, 2338}

$$\frac{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2Bgin(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*x)),x]
```

```
[Out] (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(2*B*(b*c - a*d)*g*i*n)
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(139c+139dx)(ag+bgx)}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g(c+dx)}\right)dx$$

$$= \frac{b\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{139(bc-ad)g} - \frac{d\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{139(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+d}{139(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+d}{139(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+d}{139(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} + \frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)}{139(bc-ad)g} -$$

$$= -\frac{Bn\log^2(a+bx)}{278(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} + \frac{Bn\log\left(-\right.}{139}$$

$$= -\frac{Bn\log^2(a+bx)}{278(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} + \frac{Bn\log\left(-\right.}{139}$$

<u>Mathematica</u> **[C]** Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.08, size = 219, normalized size = 4.38

$$\frac{2A\log(a+bx) - Bn\log^2(a+bx) + 2B\log(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) - 2A\log(c+dx) + 2Bn\log\left(\frac{d(a+bx)}{-bc+ad}\right)\log(c+dx) - 2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\log(c+dx) - Bn\log^2(c+dx) + 2Bn\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right) + 2Bn\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right) + 2Bn\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)}{2(bc-ad)gi}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*
x)),x]
```

```
[Out] (2*A*Log[a + b*x] - B*n*Log[a + b*x]^2 + 2*B*Log[a + b*x]*Log[e*((a + b*x)/
(c + d*x))^n] - 2*A*Log[c + d*x] + 2*B*n*Log[(d*(a + b*x))/(-(b*c) + a*d)]*
Log[c + d*x] - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x] - B*n*Log[c
+ d*x]^2 + 2*B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 2*B*n*PolyLo
g[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*B*n*PolyLog[2, (b*(c + d*x))/(b*c -
a*d)])/(2*(b*c - a*d)*g*i)
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{(bgx + ag)\,(dix + ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 172 vs. $2(46) = 92$.
time = 0.28, size = 172, normalized size = 3.44

$$-B\left(\frac{\log(bx+a)}{(-i\,bc+i\,ad)g} - \frac{\log(dx+c)}{(-i\,bc+i\,ad)g}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right) + \frac{\left(i\,\log(bx+a)^{2} - 2i\,\log(bx+a)\log(dx+c) + i\,\log(dx+c)^{2}\right)Bn}{2\,(bcg-adg)} - A\left(\frac{\log(bx+a)}{(-i\,bc+i\,ad)g} - \frac{\log(dx+c)}{(-i\,bc+i\,ad)g}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] -B*(log(b*x + a)/((-I*b*c + I*a*d)*g) - log(d*x + c)/((-I*b*c + I*a*d)*g))*
log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/2*(I*log(b*x + a)^2 - 2*I*log(b*
x + a)*log(d*x + c) + I*log(d*x + c)^2)*B*n/(b*c*g - a*d*g) - A*(log(b*x +
a)/((-I*b*c + I*a*d)*g) - log(d*x + c)/((-I*b*c + I*a*d)*g))
```

Fricas [A]
time = 0.39, size = 59, normalized size = 1.18

$$-\frac{i\,Bn\log\left(\frac{bx+a}{dx+c}\right)^{2} - 2\,(-i\,A - i\,B)\log\left(\frac{bx+a}{dx+c}\right)}{2\,(bc-ad)g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] -1/2*(I*B*n*log((b*x + a)/(d*x + c))^2 - 2*(-I*A - I*B)*log((b*x + a)/(d*x
+ c)))/((b*c - a*d)*g)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A}{ac+adx+bcx+bdx^{2}}\,dx + \int \frac{B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{ac+adx+bcx+bdx^{2}}\,dx}{gi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] (Integral(A/(a*c + a*d*x + b*c*x + b*d*x**2), x) + Integral(B*log(e*(a/(c +
 d*x) + b*x/(c + d*x))**n)/(a*c + a*d*x + b*c*x + b*d*x**2), x))/(g*i)
```

Giac [A]
time = 2.58, size = 88, normalized size = 1.76

$$-\frac{\left(i\,Bn\log\left(\frac{bx+a}{dx+c}\right)^2+2i\,A\log\left(\frac{bx+a}{dx+c}\right)+2i\,B\log\left(\frac{bx+a}{dx+c}\right)\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)}{2\,g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] -1/2*(I*B*n*log((b*x + a)/(d*x + c))^2 + 2*I*A*log((b*x + a)/(d*x + c)) + 2
*I*B*log((b*x + a)/(d*x + c)))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)/g
```

Mupad [B]
time = 5.72, size = 76, normalized size = 1.52

$$-\frac{B\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^2-A\,n\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,4\mathrm{i}}{2\,g\,i\,n\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)*(c*i + d*i*x)),x)
```

```
[Out] -(B*log(e*((a + b*x)/(c + d*x))^n)^2 - A*n*atan((b*c*2i + b*d*x*2i)/(a*d -
b*c) + 1i)*4i)/(2*g*i*n*(a*d - b*c))
```

3.140 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)}\,dx$

Optimal. Leaf size=181

$$-\frac{bBn(c+dx)}{(bc-ad)^2g^2i(a+bx)}-\frac{b(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^2g^2i(a+bx)}-\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log\left(\frac{a+bx}{c+dx}\right)}{(bc-ad)^2g^2i}+\frac{Bdn\log^2}{2(bc-a}$$

```
[Out] -b*B*n*(d*x+c)/(-a*d+b*c)^2/g^2/i/(b*x+a)-b*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x
+c))^n))/(-a*d+b*c)^2/g^2/i/(b*x+a)-d*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b
*x+a)/(d*x+c))/(-a*d+b*c)^2/g^2/i+1/2*B*d*n*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c
)^2/g^2/i
```

Rubi [A]

time = 0.12, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.116$, Rules used = {2561, 45, 2372, 14, 2338}

$$-\frac{d\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i(bc-ad)^2}-\frac{b(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i(a+bx)(bc-ad)^2}-\frac{bBn(c+dx)}{g^2i(a+bx)(bc-ad)^2}+\frac{Bdn\log^2\left(\frac{a+bx}{c+dx}\right)}{2g^2i(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*i*x)),
x]
```

```
[Out] -((b*B*n*(c + d*x))/((b*c - a*d)^2*g^2*i*(a + b*x))) - (b*(c + d*x)*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^2*i*(a + b*x)) - (d*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^2*
g^2*i) + (B*d*n*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^2*g^2*i)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(140c+140dx)(ag+bgx)^2}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)g^2(a+bx)^2} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)^2g^2(a+bx)} + \frac{d^2\left(A+\right.}{140(bc-}\right.$$

$$= -\frac{(bd)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{140(bc-ad)^2g^2} + \frac{d^2\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{140(bc-ad)^2g^2} + \frac{b\int \frac{A+B\log\left(e\right.}{(a+}}{140(bc-}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)^2g^2} + \frac{d}{}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)^2g^2} + \frac{d}{}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)^2g^2} + \frac{d}{}$$

$$= -\frac{Bn}{140(bc-ad)g^2(a+bx)} - \frac{Bdn\log(a+bx)}{140(bc-ad)^2g^2} - \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc-ad)g^2(a+bx}$$

$$= -\frac{Bn}{140(bc-ad)g^2(a+bx)} - \frac{Bdn\log(a+bx)}{140(bc-ad)^2g^2} + \frac{Bdn\log^2(a+bx)}{280(bc-ad)^2g^2} - \frac{A}{14}$$

$$= -\frac{Bn}{140(bc-ad)g^2(a+bx)} - \frac{Bdn\log(a+bx)}{140(bc-ad)^2g^2} + \frac{Bdn\log^2(a+bx)}{280(bc-ad)^2g^2} - \frac{A}{14}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.20, size = 304, normalized size = 1.68

$$-\frac{2(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2d(a+bx)\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-2d(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)+2Bn(bc-ad+d(a+bx)\log(a+bx)-d(a+bx)\log(c+dx))-Bdn(a+bx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+Bdn(a+bx)\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{2(bc-ad)^2g^2i(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*
i*x)),x]
```

```
[Out] -1/2*(2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d*(a + b*x)*
Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*d*(a + b*x)*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 2*B*n*(b*c - a*d + d*(a + b*
x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*n*(a + b*x)*(Log[a + b*x]
*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)]) + B*d*n*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
/((b*c - a*d)^2*g^2*i*(a + b*x))
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{\left(bgx+ag\right)^{2}\left(dix+ci\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 425 vs. $2(169) = 338$.
time = 0.31, size = 425, normalized size = 2.35

$$B\left(\frac{1}{(-i\,b^2c+i\,abd)g^2x+(-i\,abc+i\,a^2d)g^2}-\frac{d\log(bx+a)}{(i\,b^2c^2-2i\,abcd+i\,a^2d^2)g^2}+\frac{d\log(dx+c)}{(i\,b^2c^2-2i\,abcd+i\,a^2d^2)g^2}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)-\frac{\left((i\,bdx+i\,ad)\log(bx+a)^2+(i\,bdx+i\,ad)\log(dx+c)^2-2i\,bc+2i\,ad-2\,(i\,bdx+i\,ad)\log(bx+a)-2\,(-i\,bdx-i\,ad+(i\,bdx+i\,ad)\log(bx+a))\log(dx+c)\right)Bn}{2\,(ab^2c^2g^2-2\,a^2bcdg^2+a^3d^2g^2+(b^3c^2g^2-2\,ab^2cdg^2+a^2bd^2g^2)x)}+A\left(\frac{1}{(-i\,b^2c+i\,abd)g^2x+(-i\,abc+i\,a^2d)g^2}-\frac{d\log(bx+a)}{(i\,b^2c^2-2i\,abcd+i\,a^2d^2)g^2}+\frac{d\log(dx+c)}{(i\,b^2c^2-2i\,abcd+i\,a^2d^2)g^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] B*(1/((-I*b^2*c + I*a*b*d)*g^2*x + (-I*a*b*c + I*a^2*d)*g^2) - d*log(b*x +
a)/((I*b^2*c^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2) + d*log(d*x + c)/((I*b^2*c^2
 - 2*I*a*b*c*d + I*a^2*d^2)*g^2))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) -
1/2*((I*b*d*x + I*a*d)*log(b*x + a)^2 + (I*b*d*x + I*a*d)*log(d*x + c)^2 -
2*I*b*c + 2*I*a*d - 2*(I*b*d*x + I*a*d)*log(b*x + a) - 2*(-I*b*d*x - I*a*d
```

```
+ (I*b*d*x + I*a*d)*log(b*x + a))*log(d*x + c))*B*n/(a*b^2*c^2*g^2 - 2*a^2*
b*c*d*g^2 + a^3*d^2*g^2 + (b^3*c^2*g^2 - 2*a*b^2*c*d*g^2 + a^2*b*d^2*g^2)*x
) + A*(1/((-I*b^2*c + I*a*b*d)*g^2*x + (-I*a*b*c + I*a^2*d)*g^2) - d*log(b*
x + a)/((I*b^2*c^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2) + d*log(d*x + c)/((I*b^2
*c^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2))
```

Fricas [A]
time = 0.42, size = 183, normalized size = 1.01

$$-\frac{2\,(-i\,A-i\,B)bc+2\,(i\,A+i\,B)ad-(i\,Bbdnx+i\,Badn)\log\left(\frac{bx+a}{dx+c}\right)^{2}+2\,(-i\,Bbc+i\,Bad)n+2\,(-i\,Bbcn+(-i\,A-i\,B)ad+(-i\,Bbdn+(-i\,A-i\,B)bd)x)\log\left(\frac{bx+a}{dx+c}\right)}{2\,((b^{3}c^{2}-2\,ab^{2}cd+a^{2}bd^{2})g^{2}x+(ab^{2}c^{2}-2\,a^{2}bcd+a^{3}d^{2})g^{2})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] -1/2*(2*(-I*A - I*B)*b*c + 2*(I*A + I*B)*a*d - (I*B*b*d*n*x + I*B*a*d*n)*lo
g((b*x + a)/(d*x + c))^2 + 2*(-I*B*b*c + I*B*a*d)*n + 2*(-I*B*b*c*n + (-I*A
 - I*B)*a*d + (-I*B*b*d*n + (-I*A - I*B)*b*d)*x)*log((b*x + a)/(d*x + c)))/
((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^2*x + (a*b^2*c^2 - 2*a^2*b*c*d + a^3
*d^2)*g^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)/((b*g*x + a*g)^2*(I*d*x +
I*c)), x)
```

Mupad [B]
time = 6.08, size = 239, normalized size = 1.32

$$\frac{A}{g^2\,i\,\left(a\,d-b\,c\right)\,\left(a+b\,x\right)}+\frac{B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{g^2\,i\,\left(a\,d-b\,c\right)\,\left(a+b\,x\right)}+\frac{B\,n}{g^2\,i\,\left(a\,d-b\,c\right)\,\left(a+b\,x\right)}-\frac{B\,d\,{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}^2}{2\,g^2\,i\,n\,{\left(a\,d-b\,c\right)}^2}+\frac{A\,d\,\mathrm{atan}\left(\frac{a\,d\,1{}\mathrm{i}+b\,c\,1{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}\right)\,2{}\mathrm{i}}{g^2\,i\,{\left(a\,d-b\,c\right)}^2}+\frac{B\,d\,n\,\mathrm{atan}\left(\frac{a\,d\,1{}\mathrm{i}+b\,c\,1{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}\right)\,2{}\mathrm{i}}{g^2\,i\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)^2*(c*i + d*i*x)),
x)
```

```
[Out] A/(g^2*i*(a*d - b*c)*(a + b*x)) + (B*log(e*((a + b*x)/(c + d*x))^n))/(g^2*i
*(a*d - b*c)*(a + b*x)) + (A*d*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c
))*2i)/(g^2*i*(a*d - b*c)^2) + (B*n)/(g^2*i*(a*d - b*c)*(a + b*x)) + (B*d*n
*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(g^2*i*(a*d - b*c)^2) -
 (B*d*log(e*((a + b*x)/(c + d*x))^n)^2)/(2*g^2*i*n*(a*d - b*c)^2)
```

3.141 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)}\,dx$

Optimal. Leaf size=266

$$-\frac{Bn(c+dx)^2\left(b-\frac{4d(a+bx)}{c+dx}\right)^2}{4(bc-ad)^3g^3i(a+bx)^2}+\frac{2bd(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^3g^3i(a+bx)}-\frac{b^2(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2(bc-ad)^3g^3i(a+bx)^2}+$$

```
[Out] -1/4*B*n*(d*x+c)^2*(b-4*d*(b*x+a)/(d*x+c))^2/(-a*d+b*c)^3/g^3/i/(b*x+a)^2+2
*b*d*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^3/i/(b*x+a)-1/2
*b^2*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^3/i/(b*x+a)^2
+d^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/(-a*d+b*c)^3/g^3/i
-1/2*B*d^2*n*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^3/g^3/i
```

Rubi [A]
time = 0.16, antiderivative size = 266, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.163$, Rules used = {2561, 45, 2372, 12, 14, 37, 2338}

$$-\frac{b^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i(a+bx)^2(bc-ad)^3}+\frac{d^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(bc-ad)^3}+\frac{2bd(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(a+bx)(bc-ad)^3}-\frac{Bd^2n\log^2\left(\frac{a+bx}{c+dx}\right)}{2g^3i(bc-ad)^3}-\frac{Bn(c+dx)^2\left(b-\frac{4d(a+bx)}{c+dx}\right)^2}{4g^3i(a+bx)^2(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*i*x)),
x]
```

```
[Out] -1/4*(B*n*(c + d*x)^2*(b - (4*d*(a + b*x))/(c + d*x))^2)/((b*c - a*d)^3*g^3
*i*(a + b*x)^2) + (2*b*d*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(2*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (d^2*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^3*g^3*i) - (B
*d^2*n*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^3*g^3*i)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(141c+141dx)(ag+bgx)^3}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)g^3(a+bx)^3} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)^2g^3(a+bx)^2} + \frac{bd^2(A+}{141(bc}\right.$$

$$= \frac{(bd^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{141(bc-ad)^3g^3} - \frac{d^3\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{141(bc-ad)^3g^3} - \frac{(bd)\int \frac{A+B\log}{(}}{141(bc}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx}{14}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx}{14}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx}{14}$$

$$= -\frac{Bn}{564(bc-ad)g^3(a+bx)^2} + \frac{Bdn}{94(bc-ad)^2g^3(a+bx)} + \frac{Bd^2n\log(a+b}{94(bc-ad)^3g}$$

$$= -\frac{Bn}{564(bc-ad)g^3(a+bx)^2} + \frac{Bdn}{94(bc-ad)^2g^3(a+bx)} + \frac{Bd^2n\log(a+b}{94(bc-ad)^3g}$$

$$= -\frac{Bn}{564(bc-ad)g^3(a+bx)^2} + \frac{Bdn}{94(bc-ad)^2g^3(a+bx)} + \frac{Bd^2n\log(a+b}{94(bc-ad)^3g}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.25, size = 434, normalized size = 1.63

$$\frac{-2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+4d(bc-ad)(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+4d^2(a+bx)^2\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-4d^2(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)+4Bdn(a+bx)(bc-ad+d(a+bx)\log(a+bx)-d(a+bx)\log(c+dx))-Bn\left((bc-ad)^2+2d(-bc+ad)(a+bx)-2d^2(a+bx)^2\log(a+bx)+2d^2(a+bx)^2\log(c+dx)\right)-2Bd^2n(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+2Bd^2n(a+bx)^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^3g^3i(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*
i*x)),x]
```

```
[Out] (-2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d*(b*c - a*d)*
(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d^2*(a + b*x)^2*Log[a
+ b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*d^2*(a + b*x)^2*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 4*B*d*n*(a + b*x)*(b*c - a*d +
 d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2
+ 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a
+ b*x)^2*Log[c + d*x]) - 2*B*d^2*n*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x]
```

```
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) + 2*B*d^2*n*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c
- a*d)^3*g^3*i*(a + b*x)^2)
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{\left(bgx+ag\right)^{3}\left(dix+ci\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 885 vs. 2(249) = 498.
time = 0.38, size = 885, normalized size = 3.33

$$-\frac{1}{2}B\left(\frac{2bdx-bc+3ad}{(-ib^4c^2+2iab^3cd-ia^2b^2d^2)g^3x^2+2(-iab^3c^2+2ia^2b^2cd-ia^3bd^2)g^3x+(-ia^2b^2c^2+2ia^3bcd-ia^4d^2)g^3}+\frac{2d^2\log(bx+a)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g^3}-\frac{2d^2\log(dx+c)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g^3}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)+\frac{\left(ib^2c^2-8iabcd+7ia^2d^2-2(-ib^2d^2x^2-2iabd^2x-ia^2d^2)\log(bx+a)^2-2(-ib^2d^2x^2-2iabd^2x-ia^2d^2)\log(dx+c)^2-6(ib^2cd-iabd^2)x-6(ib^2d^2x^2+2iabd^2x+ia^2d^2)\log(bx+a)-2\left(-3ib^2d^2x^2-6iabd^2x-3ia^2d^2+2(ib^2d^2x^2+2iabd^2x+ia^2d^2)\log(bx+a)\right)\log(dx+c)\right)Bn}{4\left(a^2b^3c^3g^3-3a^3b^2c^2dg^3+3a^4bcd^2g^3-a^5d^3g^3+(b^5c^3g^3-3ab^4c^2dg^3+3a^2b^3cd^2g^3-a^3b^2d^3g^3)x^2+2(ab^4c^3g^3-3a^2b^3c^2dg^3+3a^3b^2cd^2g^3-a^4bd^3g^3)x\right)}-\frac{1}{2}A\left(\frac{2bdx-bc+3ad}{(-ib^4c^2+2iab^3cd-ia^2b^2d^2)g^3x^2+2(-iab^3c^2+2ia^2b^2cd-ia^3bd^2)g^3x+(-ia^2b^2c^2+2ia^3bcd-ia^4d^2)g^3}+\frac{2d^2\log(bx+a)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g^3}-\frac{2d^2\log(dx+c)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] -1/2*B*((2*b*d*x - b*c + 3*a*d)/((-I*b^4*c^2 + 2*I*a*b^3*c*d - I*a^2*b^2*d^
2)*g^3*x^2 + 2*(-I*a*b^3*c^2 + 2*I*a^2*b^2*c*d - I*a^3*b*d^2)*g^3*x + (-I*a
^2*b^2*c^2 + 2*I*a^3*b*c*d - I*a^4*d^2)*g^3) + 2*d^2*log(b*x + a)/((-I*b^3*
c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3) - 2*d^2*log(d*x +
 c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3))*log
((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/4*(I*b^2*c^2 - 8*I*a*b*c*d + 7*I*a^
2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^2)*log(b*x + a)^2 - 2*(
-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^2)*log(d*x + c)^2 - 6*(I*b^2*c*d -
 I*a*b*d^2)*x - 6*(I*b^2*d^2*x^2 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x + a)
- 2*(-3*I*b^2*d^2*x^2 - 6*I*a*b*d^2*x - 3*I*a^2*d^2 + 2*(I*b^2*d^2*x^2 + 2*
I*a*b*d^2*x + I*a^2*d^2)*log(b*x + a))*log(d*x + c))*B*n/(a^2*b^3*c^3*g^3 -
 3*a^3*b^2*c^2*d*g^3 + 3*a^4*b*c*d^2*g^3 - a^5*d^3*g^3 + (b^5*c^3*g^3 - 3*a
*b^4*c^2*d*g^3 + 3*a^2*b^3*c*d^2*g^3 - a^3*b^2*d^3*g^3)*x^2 + 2*(a*b^4*c^3*
g^3 - 3*a^2*b^3*c^2*d*g^3 + 3*a^3*b^2*c*d^2*g^3 - a^4*b*d^3*g^3)*x) - 1/2*A
*((2*b*d*x - b*c + 3*a*d)/((-I*b^4*c^2 + 2*I*a*b^3*c*d - I*a^2*b^2*d^2)*g^3
*x^2 + 2*(-I*a*b^3*c^2 + 2*I*a^2*b^2*c*d - I*a^3*b*d^2)*g^3*x + (-I*a^2*b^2
*c^2 + 2*I*a^3*b*c*d - I*a^4*d^2)*g^3) + 2*d^2*log(b*x + a)/((-I*b^3*c^3 +
3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3) - 2*d^2*log(d*x + c)/((
-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3))
```

Fricas [A]
time = 0.40, size = 441, normalized size = 1.66

$$\frac{2\,(i\,A+i\,B)b^2c^2+8\,(-i\,A-i\,B)abcd+6\,(i\,A+i\,B)a^2d^2+2\,(-i\,Bb^2d^2nx^2-2i\,Babd^2nx-i\,Ba^2d^2n)\log\left(\frac{bx+a}{dx+c}\right)^2-(-i\,Bb^2c^2+8i\,Babcd-7i\,Ba^2d^2)n+2\,(2\,(-i\,A-i\,B)b^2cd+2\,(i\,A+i\,B)abd^2+3\,(-i\,Bb^2cd+i\,Babd^2)n)x+2\,(2\,(-i\,A-i\,B)a^2d^2+(-3i\,Bb^2d^2n+2\,(-i\,A-i\,B)b^2d^2)x^2+(i\,Bb^2c^2-4i\,Babcd)n+2\,(2\,(-i\,A-i\,B)abd^2+(-i\,Bb^2cd-2i\,Babd^2)n)x)\log\left(\frac{bx+a}{dx+c}\right)}{4\,((b^5c^3-3\,ab^4c^2d+3\,a^2b^3cd^2-a^3b^2d^3)g^3x^2+2\,(ab^4c^3-3\,a^2b^3c^2d+3\,a^3b^2cd^2-a^4bd^3)g^3x+(a^2b^3c^3-3\,a^3b^2c^2d+3\,a^4bcd^2-a^5d^3)g^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] 1/4*(2*(I*A + I*B)*b^2*c^2 + 8*(-I*A - I*B)*a*b*c*d + 6*(I*A + I*B)*a^2*d^2
 + 2*(-I*B*b^2*d^2*n*x^2 - 2*I*B*a*b*d^2*n*x - I*B*a^2*d^2*n)*log((b*x + a)
/(d*x + c))^2 - (-I*B*b^2*c^2 + 8*I*B*a*b*c*d - 7*I*B*a^2*d^2)*n + 2*(2*(-I
*A - I*B)*b^2*c*d + 2*(I*A + I*B)*a*b*d^2 + 3*(-I*B*b^2*c*d + I*B*a*b*d^2)*
n)*x + 2*(2*(-I*A - I*B)*a^2*d^2 + (-3*I*B*b^2*d^2*n + 2*(-I*A - I*B)*b^2*d
^2)*x^2 + (I*B*b^2*c^2 - 4*I*B*a*b*c*d)*n + 2*(2*(-I*A - I*B)*a*b*d^2 + (-I
*B*b^2*c*d - 2*I*B*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c)))/((b^5*c^3 - 3*a
*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^3*x^2 + 2*(a*b^4*c^3 - 3*a^2*
b^3*c^2*d + 3*a^3*b^2*c*d^2 - a^4*b*d^3)*g^3*x + (a^2*b^3*c^3 - 3*a^3*b^2*c
^2*d + 3*a^4*b*c*d^2 - a^5*d^3)*g^3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [A]
time = 98.71, size = 97, normalized size = 0.36

$$-\frac{1}{4}\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)^2\left(-\frac{2i\,(dx+c)^2Bn\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)^2g^3}+\frac{(-i\,Bn-2i\,A-2i\,B)(dx+c)^2}{(bx+a)^2g^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] -1/4*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)^2*(-2*I*(d*x + c)^2*B*n*log((b
*x + a)/(d*x + c))/((b*x + a)^2*g^3) + (-I*B*n - 2*I*A - 2*I*B)*(d*x + c)^2
/((b*x + a)^2*g^3))
```

Mupad [B]
time = 6.34, size = 573, normalized size = 2.15

$$\frac{B\,d^2\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,\left(\frac{g^3\,i\,n\,\left(a\,d-b\,c\right)\,\left(2\,a\,d-b\,c\right)}{2\,d^2}+\frac{a\,g^3\,i\,n\,\left(a\,d-b\,c\right)}{2\,d}+\frac{b\,g^3\,i\,n\,x\,\left(a\,d-b\,c\right)}{d}\right)}{g^3\,i\,n\,\left(a\,d-b\,c\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)\,\left(i\,a^2\,g^3+2\,i\,a\,b\,g^3\,x+i\,b^2\,g^3\,x^2\right)}-\frac{B\,d^2\,{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}^2}{2\,g^3\,i\,n\,\left(a\,d-b\,c\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{\frac{6\,A\,a\,d-2\,A\,b\,c+7\,B\,a\,d\,n-B\,b\,c\,n}{2\,\left(a\,d-b\,c\right)}+\frac{d\,x\,\left(2\,A\,b+3\,B\,b\,n\right)}{a\,d-b\,c}}{x^2\,\left(2\,b^3\,c\,g^3\,i-2\,a\,b^2\,d\,g^3\,i\right)+x\,\left(4\,a\,b^2\,c\,g^3\,i-4\,a^2\,b\,d\,g^3\,i\right)-2\,a^3\,d\,g^3\,i+2\,a^2\,b\,c\,g^3\,i}+\frac{d^2\,\mathrm{atan}\left(\frac{d^2\,\left(A+\frac{3\,B\,n}{2}\right)\,\left(2\,i\,a^3\,d^3\,g^3-2\,i\,a^2\,b\,c\,d^2\,g^3-2\,i\,a\,b^2\,c^2\,d\,g^3+2\,i\,b^3\,c^3\,g^3\right)\,1{}\mathrm{i}}{g^3\,i\,\left(2\,A\,d^2+3\,B\,d^2\,n\right)\,{\left(a\,d-b\,c\right)}^3}+\frac{b\,d^3\,x\,\left(A+\frac{3\,B\,n}{2}\right)\,\left(i\,a^2\,d^2\,g^3-2\,i\,a\,b\,c\,d\,g^3+i\,b^2\,c^2\,g^3\right)\,4{}\mathrm{i}}{g^3\,i\,\left(2\,A\,d^2+3\,B\,d^2\,n\right)\,{\left(a\,d-b\,c\right)}^3}\right)\,\left(A+\frac{3\,B\,n}{2}\right)\,2{}\mathrm{i}}{g^3\,i\,{\left(a\,d-b\,c\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)^3*(c*i + d*i*x)),
x)
```

```
[Out] (d^2*atan((d^2*(A + (3*B*n)/2)*(2*a^3*d^3*g^3*i + 2*b^3*c^3*g^3*i - 2*a*b^2
*c^2*d*g^3*i - 2*a^2*b*c*d^2*g^3*i)*1i)/(g^3*i*(2*A*d^2 + 3*B*d^2*n)*(a*d -
 b*c)^3) + (b*d^3*x*(A + (3*B*n)/2)*(a^2*d^2*g^3*i + b^2*c^2*g^3*i - 2*a*b*
c*d*g^3*i)*4i)/(g^3*i*(2*A*d^2 + 3*B*d^2*n)*(a*d - b*c)^3))*(A + (3*B*n)/2)
*2i)/(g^3*i*(a*d - b*c)^3) - ((6*A*a*d - 2*A*b*c + 7*B*a*d*n - B*b*c*n)/(2*
(a*d - b*c)) + (d*x*(2*A*b + 3*B*b*n))/(a*d - b*c))/(x^2*(2*b^3*c*g^3*i - 2
*a*b^2*d*g^3*i) + x*(4*a*b^2*c*g^3*i - 4*a^2*b*d*g^3*i) - 2*a^3*d*g^3*i + 2
*a^2*b*c*g^3*i) - (B*d^2*log(e*((a + b*x)/(c + d*x))^n)^2)/(2*g^3*i*n*(a*d
- b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (B*d^2*log(e*((a + b*x)/(c + d*x)
)^n)*((g^3*i*n*(a*d - b*c)*(2*a*d - b*c))/(2*d^2) + (a*g^3*i*n*(a*d - b*c))
/(2*d) + (b*g^3*i*n*x*(a*d - b*c))/d))/(g^3*i*n*(a*d - b*c)*(a^2*d^2 + b^2*
c^2 - 2*a*b*c*d)*(a^2*g^3*i + b^2*g^3*i*x^2 + 2*a*b*g^3*i*x))
```

3.142 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)}\,dx$

Optimal. Leaf size=389

$$-\frac{3bBd^2n(c+dx)}{(bc-ad)^4g^4i(a+bx)}+\frac{3b^2Bdn(c+dx)^2}{4(bc-ad)^4g^4i(a+bx)^2}-\frac{b^3Bn(c+dx)^3}{9(bc-ad)^4g^4i(a+bx)^3}-\frac{3bd^2(c+dx)\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{(bc-ad)^4g^4i(a+bx)}$$

```
[Out] -3*b*B*d^2*n*(d*x+c)/(-a*d+b*c)^4/g^4/i/(b*x+a)+3/4*b^2*B*d*n*(d*x+c)^2/(-a
*d+b*c)^4/g^4/i/(b*x+a)^2-1/9*b^3*B*n*(d*x+c)^3/(-a*d+b*c)^4/g^4/i/(b*x+a)^
3-3*b*d^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^4/i/(b*x+a
)+3/2*b^2*d*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^4/i/(b
*x+a)^2-1/3*b^3*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^4/
i/(b*x+a)^3-d^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/(-a*d+b
*c)^4/g^4/i+1/2*B*d^3*n*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^4/g^4/i
```

Rubi [A]
time = 0.20, antiderivative size = 389, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.140$, Rules used = {2561, 45, 2372, 12, 14, 2338}

$$-\frac{b^3(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4i(a+bx)^3(bc-ad)^4}+\frac{3b^2d(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^4i(a+bx)^2(bc-ad)^4}-\frac{d^3\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i(bc-ad)^4}-\frac{3bd^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i(a+bx)(bc-ad)^4}-\frac{b^3Bn(c+dx)^3}{9g^4i(a+bx)^3(bc-ad)^4}+\frac{3b^2Bdn(c+dx)^2}{4g^4i(a+bx)^2(bc-ad)^4}+\frac{Bd^3n\log^2\left(\frac{a+bx}{c+dx}\right)}{2g^4i(bc-ad)^4}-\frac{3bBd^2n(c+dx)}{g^4i(a+bx)(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*i*x)),
x]
```

```
[Out] (-3*b*B*d^2*n*(c + d*x))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*B*d*n*(c
+ d*x)^2)/(4*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (b^3*B*n*(c + d*x)^3)/(9*(b
*c - a*d)^4*g^4*i*(a + b*x)^3) - (3*b*d^2*(c + d*x)*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*d*(c + d*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^4*i*(a + b*x)^2) -
(b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^4*g
^4*i*(a + b*x)^3) - (d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*
x)/(c + d*x)])/((b*c - a*d)^4*g^4*i) + (B*d^3*n*Log[(a + b*x)/(c + d*x)]^2)
/(2*(b*c - a*d)^4*g^4*i)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(142c+142dx)(ag+bgx)^4}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc-ad)g^4(a+bx)^4} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc-ad)^2g^4(a+bx)^3} + \frac{bd^2\left(A+\right.}{142(bc-}\right.$$

$$= -\frac{(bd^3)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{142(bc-ad)^4g^4} + \frac{d^4\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{142(bc-ad)^4g^4} + \frac{(bd^2)\int \frac{A+}{}}{142(b}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{426(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{284(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\right.}{142(bc-ad}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{426(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{284(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\right.}{142(bc-ad}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{426(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{284(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\right.}{142(bc-ad}$$

$$= -\frac{Bn}{1278(bc-ad)g^4(a+bx)^3} + \frac{5Bdn}{1704(bc-ad)^2g^4(a+bx)^2} - \frac{11}{852(bc-a}$$

$$= -\frac{Bn}{1278(bc-ad)g^4(a+bx)^3} + \frac{5Bdn}{1704(bc-ad)^2g^4(a+bx)^2} - \frac{11}{852(bc-a}$$

$$= -\frac{Bn}{1278(bc-ad)g^4(a+bx)^3} + \frac{5Bdn}{1704(bc-ad)^2g^4(a+bx)^2} - \frac{11}{852(bc-a}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.46, size = 518, normalized size = 1.33

$$\frac{-\frac{12A(bc-ad)^3}{(a+bx)^3} - \frac{4B(bc-ad)^3n}{(a+bx)^3} + \frac{18Ad(bc-ad)^2}{(a+bx)^2} + \frac{15Bd(bc-ad)^2n}{(a+bx)^2} + \frac{36Ad^2(-bc+ad)}{a+bx} + \frac{66Bd^2(-bc+ad)n}{a+bx} - 36Ad^3\log(a+bx) - 66Bd^3n\log(a+bx) + 18Bd^3n\log^2(a+bx) - \frac{12B(bc-ad)^3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^3} + \frac{18Bd(bc-ad)^2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2} + \frac{36Bd^2(-bc+ad)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} - 36Bd^3\log(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + 36Ad^3\log(c+dx) + 66Bd^3n\log(c+dx) - 36Bd^3n\log\left(\frac{d(a+bx)}{-bc+ad}\right)\log(c+dx) + 36Bd^3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\log(c+dx) + 18Bd^3n\log^2(c+dx) - 36Bd^3n\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right) - 36Bd^3n\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right) - 36Bd^3n\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)}{36(bc-ad)^4g^4i}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*
i*x)),x]
```

```
[Out] ((-12*A*(b*c - a*d)^3)/(a + b*x)^3 - (4*B*(b*c - a*d)^3*n)/(a + b*x)^3 + (1
8*A*d*(b*c - a*d)^2)/(a + b*x)^2 + (15*B*d*(b*c - a*d)^2*n)/(a + b*x)^2 + (
36*A*d^2*(-(b*c) + a*d))/(a + b*x) + (66*B*d^2*(-(b*c) + a*d)*n)/(a + b*x)
- 36*A*d^3*Log[a + b*x] - 66*B*d^3*n*Log[a + b*x] + 18*B*d^3*n*Log[a + b*x]
^2 - (12*B*(b*c - a*d)^3*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x)^3 + (18*
B*d*(b*c - a*d)^2*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x)^2 + (36*B*d^2*(
-(b*c) + a*d)*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x) - 36*B*d^3*Log[a +
```

```
b*x]*Log[e*((a + b*x)/(c + d*x))^n] + 36*A*d^3*Log[c + d*x] + 66*B*d^3*n*Lo
g[c + d*x] - 36*B*d^3*n*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 36
*B*d^3*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x] + 18*B*d^3*n*Log[c + d*x
]^2 - 36*B*d^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 36*B*d^3*n*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 36*B*d^3*n*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(36*(b*c - a*d)^4*g^4*i)
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{A + B \ln \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)}{\left(bgx + ag\right)^{4} \left(dix + ci\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1458 vs. 2(359) = 718.
time = 0.52, size = 1458, normalized size = 3.75

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] -1/6*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
5*a*b*d^2)*x)/((I*b^6*c^3 - 3*I*a*b^5*c^2*d + 3*I*a^2*b^4*c*d^2 - I*a^3*b^3
*d^3)*g^4*x^3 + 3*(I*a*b^5*c^3 - 3*I*a^2*b^4*c^2*d + 3*I*a^3*b^3*c*d^2 - I*
a^4*b^2*d^3)*g^4*x^2 + 3*(I*a^2*b^4*c^3 - 3*I*a^3*b^3*c^2*d + 3*I*a^4*b^2*c
*d^2 - I*a^5*b*d^3)*g^4*x + (I*a^3*b^3*c^3 - 3*I*a^4*b^2*c^2*d + 3*I*a^5*b*
c*d^2 - I*a^6*d^3)*g^4) + 6*d^3*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d
+ 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4) - 6*d^3*log(d*x +
 c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 +
 I*a^4*d^4)*g^4))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/36*(-4*I*b^3*c
^3 + 27*I*a*b^2*c^2*d - 108*I*a^2*b*c*d^2 + 85*I*a^3*d^3 - 66*(I*b^3*c*d^2
- I*a*b^2*d^3)*x^2 - 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3
*x - I*a^3*d^3)*log(b*x + a)^2 - 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3
*I*a^2*b*d^3*x - I*a^3*d^3)*log(d*x + c)^2 - 3*(-5*I*b^3*c^2*d + 54*I*a*b^2
*c*d^2 - 49*I*a^2*b*d^3)*x - 66*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^
2*b*d^3*x + I*a^3*d^3)*log(b*x + a) - 6*(-11*I*b^3*d^3*x^3 - 33*I*a*b^2*d^3
*x^2 - 33*I*a^2*b*d^3*x - 11*I*a^3*d^3 + 6*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x
^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a))*log(d*x + c))*B*n/(a^3*b^4*
```

```
c^4*g^4 - 4*a^4*b^3*c^3*d*g^4 + 6*a^5*b^2*c^2*d^2*g^4 - 4*a^6*b*c*d^3*g^4 +
 a^7*d^4*g^4 + (b^7*c^4*g^4 - 4*a*b^6*c^3*d*g^4 + 6*a^2*b^5*c^2*d^2*g^4 - 4
*a^3*b^4*c*d^3*g^4 + a^4*b^3*d^4*g^4)*x^3 + 3*(a*b^6*c^4*g^4 - 4*a^2*b^5*c^
3*d*g^4 + 6*a^3*b^4*c^2*d^2*g^4 - 4*a^4*b^3*c*d^3*g^4 + a^5*b^2*d^4*g^4)*x^
2 + 3*(a^2*b^5*c^4*g^4 - 4*a^3*b^4*c^3*d*g^4 + 6*a^4*b^3*c^2*d^2*g^4 - 4*a^
5*b^2*c*d^3*g^4 + a^6*b*d^4*g^4)*x) - 1/6*A*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7
*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((I*b^6*c^3 - 3*I*a*b^5*
c^2*d + 3*I*a^2*b^4*c*d^2 - I*a^3*b^3*d^3)*g^4*x^3 + 3*(I*a*b^5*c^3 - 3*I*a
^2*b^4*c^2*d + 3*I*a^3*b^3*c*d^2 - I*a^4*b^2*d^3)*g^4*x^2 + 3*(I*a^2*b^4*c^
3 - 3*I*a^3*b^3*c^2*d + 3*I*a^4*b^2*c*d^2 - I*a^5*b*d^3)*g^4*x + (I*a^3*b^3
*c^3 - 3*I*a^4*b^2*c^2*d + 3*I*a^5*b*c*d^2 - I*a^6*d^3)*g^4) + 6*d^3*log(b*
x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^
3 + I*a^4*d^4)*g^4) - 6*d^3*log(d*x + c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*
I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4))
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 773 vs. 2(359) = 718.
time = 0.44, size = 773, normalized size = 1.99

$$-\frac{12\,(-i\,A-i\,B)b^3c^3+54\,(i\,A+i\,B)ab^2c^2d+108\,(-i\,A-i\,B)a^2bcd^2+66\,(i\,A+i\,B)a^3d^3+6\,(6\,(-i\,A-i\,B)b^3cd^2+6\,(i\,A+i\,B)ab^2d^3+11\,(-i\,Bb^3cd^2+i\,Bab^2d^3)n)x^2+18\,(-i\,Bb^3d^3nx^3-3i\,Bab^2d^3nx^2-3i\,Ba^2bd^3nx-i\,Ba^3d^3n)\log\left(\frac{bx+a}{dx+c}\right)^2-(4i\,Bb^3c^3-27i\,Bab^2c^2d+108i\,Ba^2bcd^2-85i\,Ba^3d^3)n+3\,(6\,(i\,A+i\,B)b^3c^2d+36\,(-i\,A-i\,B)ab^2cd^2+30\,(i\,A+i\,B)a^2bd^3+(5i\,Bb^3c^2d-54i\,Bab^2cd^2+49i\,Ba^2bd^3)n)x+6\,(6\,(-i\,A-i\,B)a^3d^3+(-11i\,Bb^3d^3n+6\,(-i\,A-i\,B)b^3d^3)x^3+3\,(6\,(-i\,A-i\,B)ab^2d^3+(-2i\,Bb^3cd^2-9i\,Bab^2d^3)n)x^2+(-2i\,Bb^3c^3+9i\,Bab^2c^2d-18i\,Ba^2bcd^2)n+3\,(6\,(-i\,A-i\,B)a^2bd^3+(i\,Bb^3c^2d-6i\,Bab^2cd^2-6i\,Ba^2bd^3)n)x)\log\left(\frac{bx+a}{dx+c}\right)}{36\,((b^7c^4-4\,ab^6c^3d+6\,a^2b^5c^2d^2-4\,a^3b^4cd^3+a^4b^3d^4)g^4x^3+3\,(ab^6c^4-4\,a^2b^5c^3d+6\,a^3b^4c^2d^2-4\,a^4b^3cd^3+a^5b^2d^4)g^4x^2+3\,(a^2b^5c^4-4\,a^3b^4c^3d+6\,a^4b^3c^2d^2-4\,a^5b^2cd^3+a^6bd^4)g^4x+(a^3b^4c^4-4\,a^4b^3c^3d+6\,a^5b^2c^2d^2-4\,a^6bcd^3+a^7d^4)g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] -1/36*(12*(-I*A - I*B)*b^3*c^3 + 54*(I*A + I*B)*a*b^2*c^2*d + 108*(-I*A - I
*B)*a^2*b*c*d^2 + 66*(I*A + I*B)*a^3*d^3 + 6*(6*(-I*A - I*B)*b^3*c*d^2 + 6*
(I*A + I*B)*a*b^2*d^3 + 11*(-I*B*b^3*c*d^2 + I*B*a*b^2*d^3)*n)*x^2 + 18*(-I
*B*b^3*d^3*n*x^3 - 3*I*B*a*b^2*d^3*n*x^2 - 3*I*B*a^2*b*d^3*n*x - I*B*a^3*d^
3*n)*log((b*x + a)/(d*x + c))^2 - (4*I*B*b^3*c^3 - 27*I*B*a*b^2*c^2*d + 108
*I*B*a^2*b*c*d^2 - 85*I*B*a^3*d^3)*n + 3*(6*(I*A + I*B)*b^3*c^2*d + 36*(-I*
A - I*B)*a*b^2*c*d^2 + 30*(I*A + I*B)*a^2*b*d^3 + (5*I*B*b^3*c^2*d - 54*I*B
*a*b^2*c*d^2 + 49*I*B*a^2*b*d^3)*n)*x + 6*(6*(-I*A - I*B)*a^3*d^3 + (-11*I*
B*b^3*d^3*n + 6*(-I*A - I*B)*b^3*d^3)*x^3 + 3*(6*(-I*A - I*B)*a*b^2*d^3 + (
-2*I*B*b^3*c*d^2 - 9*I*B*a*b^2*d^3)*n)*x^2 + (-2*I*B*b^3*c^3 + 9*I*B*a*b^2*
c^2*d - 18*I*B*a^2*b*c*d^2)*n + 3*(6*(-I*A - I*B)*a^2*b*d^3 + (I*B*b^3*c^2*
d - 6*I*B*a*b^2*c*d^2 - 6*I*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))/((
b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4
)*g^4*x^3 + 3*(a*b^6*c^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*
c*d^3 + a^5*b^2*d^4)*g^4*x^2 + 3*(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3
*c^2*d^2 - 4*a^5*b^2*c*d^3 + a^6*b*d^4)*g^4*x + (a^3*b^4*c^4 - 4*a^4*b^3*c^
3*d + 6*a^5*b^2*c^2*d^2 - 4*a^6*b*c*d^3 + a^7*d^4)*g^4)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [A]
time = 139.65, size = 236, normalized size = 0.61

$$-\frac{1}{36}\left(\frac{6\left(-2i\,Bbn-\frac{3(-i\,bx-i\,a)Bdn}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^3bcg^4}{(dx+c)^3}-\frac{(bx+a)^3adg^4}{(dx+c)^3}}+\frac{-4i\,Bbn-\frac{9(-i\,bx-i\,a)Bdn}{dx+c}-12i\,Ab-12i\,Bb-\frac{18(-i\,bx-i\,a)Ad}{dx+c}-\frac{18(-i\,bx-i\,a)Bd}{dx+c}}{\frac{(bx+a)^3bcg^4}{(dx+c)^3}-\frac{(bx+a)^3adg^4}{(dx+c)^3}}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] -1/36*(6*(-2*I*B*b*n - 3*(-I*b*x - I*a)*B*d*n/(d*x + c))*log((b*x + a)/(d*x
 + c))/((b*x + a)^3*b*c*g^4/(d*x + c)^3 - (b*x + a)^3*a*d*g^4/(d*x + c)^3)
+ (-4*I*B*b*n - 9*(-I*b*x - I*a)*B*d*n/(d*x + c) - 12*I*A*b - 12*I*B*b - 18
*(-I*b*x - I*a)*A*d/(d*x + c) - 18*(-I*b*x - I*a)*B*d/(d*x + c))/((b*x + a)
^3*b*c*g^4/(d*x + c)^3 - (b*x + a)^3*a*d*g^4/(d*x + c)^3))*(b*c/(b*c - a*d)
^2 - a*d/(b*c - a*d)^2)^2
```

Mupad [B]
time = 7.23, size = 986, normalized size = 2.53

$$\frac{\frac{66\,A\,a^2\,d^2+12\,A\,b^2\,c^2+85\,B\,a^2\,d^2\,n+4\,B\,b^2\,c^2\,n-42\,A\,a\,b\,c\,d-23\,B\,a\,b\,c\,d\,n}{6\,(a\,d-b\,c)}+\frac{x\,(30\,A\,a\,b\,d^2-6\,A\,b^2\,c\,d+49\,B\,a\,b\,d^2\,n-5\,B\,b^2\,c\,d\,n)}{2\,(a\,d-b\,c)}+\frac{d\,x^2\,(6\,A\,b^2\,d+11\,B\,b^2\,d\,n)}{a\,d-b\,c}}{x\,(18\,i\,a^4\,b\,d^2\,g^4-36\,i\,a^3\,b^2\,c\,d\,g^4+18\,i\,a^2\,b^3\,c^2\,g^4)+x^2\,(18\,i\,a^3\,b^2\,d^2\,g^4-36\,i\,a^2\,b^3\,c\,d\,g^4+18\,i\,a\,b^4\,c^2\,g^4)+x^3\,(6\,i\,a^2\,b^3\,d^2\,g^4-12\,i\,a\,b^4\,c\,d\,g^4+6\,i\,b^5\,c^2\,g^4)+6\,a^5\,d^2\,g^4\,i+6\,a^3\,b^2\,c^2\,g^4\,i-12\,a^4\,b\,c\,d\,g^4\,i}-\frac{B\,d^3\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)^2}{2\,g^4\,i\,n\,(a\,d-b\,c)\,(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3)}+\frac{B\,d^3\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\left(x\left(b\left(\frac{g^4\,i\,n\,(a\,d-b\,c)\,(3\,a\,d-b\,c)}{6\,d^2}+\frac{a\,g^4\,i\,n\,(a\,d-b\,c)}{3\,d}\right)+\frac{2\,a\,b\,g^4\,i\,n\,(a\,d-b\,c)}{3\,d}+\frac{b\,g^4\,i\,n\,(a\,d-b\,c)\,(3\,a\,d-b\,c)}{3\,d^2}\right)+a\left(\frac{g^4\,i\,n\,(a\,d-b\,c)\,(3\,a\,d-b\,c)}{6\,d^2}+\frac{a\,g^4\,i\,n\,(a\,d-b\,c)}{3\,d}\right)+\frac{g^4\,i\,n\,(a\,d-b\,c)\,(3\,a^2\,d^2-3\,a\,b\,c\,d+b^2\,c^2)}{3\,d^2}+\frac{b^2\,g^4\,i\,n\,x^2\,(a\,d-b\,c)}{d}\right)}{g^4\,i\,n\,(a\,d-b\,c)\,(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3)\,(i\,a^3\,g^4+3\,i\,a^2\,b\,g^4\,x+3\,i\,a\,b^2\,g^4\,x^2+i\,b^3\,g^4\,x^3)}+\frac{d^3\,\mathrm{atan}\left(\frac{d^3\left(\frac{i\,a^4\,d^4\,g^4-2\,i\,a^3\,b\,c\,d^3\,g^4+2\,i\,a\,b^3\,c^3\,d\,g^4-i\,b^4\,c^4\,g^4}{i\,a^3\,d^3\,g^4-3\,i\,a^2\,b\,c\,d^2\,g^4+3\,i\,a\,b^2\,c^2\,d\,g^4-i\,b^3\,c^3\,g^4}+2\,b\,d\,x\right)\left(A+\frac{11\,B\,n}{6}\right)(i\,a^3\,d^3\,g^4-3\,i\,a^2\,b\,c\,d^2\,g^4+3\,i\,a\,b^2\,c^2\,d\,g^4-i\,b^3\,c^3\,g^4)\,6{}\mathrm{i}}{g^4\,i\,(6\,A\,d^3+11\,B\,d^3\,n)\,{(a\,d-b\,c)}^4}\right)\left(A+\frac{11\,B\,n}{6}\right)2{}\mathrm{i}}{g^4\,i\,{(a\,d-b\,c)}^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)^4*(c*i + d*i*x)),
x)
```

```
[Out] ((66*A*a^2*d^2 + 12*A*b^2*c^2 + 85*B*a^2*d^2*n + 4*B*b^2*c^2*n - 42*A*a*b*c
*d - 23*B*a*b*c*d*n)/(6*(a*d - b*c)) + (x*(30*A*a*b*d^2 - 6*A*b^2*c*d + 49*
B*a*b*d^2*n - 5*B*b^2*c*d*n))/(2*(a*d - b*c)) + (d*x^2*(6*A*b^2*d + 11*B*b^
2*d*n))/(a*d - b*c))/(x*(18*a^4*b*d^2*g^4*i + 18*a^2*b^3*c^2*g^4*i - 36*a^3
*b^2*c*d*g^4*i) + x^2*(18*a*b^4*c^2*g^4*i + 18*a^3*b^2*d^2*g^4*i - 36*a^2*b
^3*c*d*g^4*i) + x^3*(6*b^5*c^2*g^4*i + 6*a^2*b^3*d^2*g^4*i - 12*a*b^4*c*d*g
^4*i) + 6*a^5*d^2*g^4*i + 6*a^3*b^2*c^2*g^4*i - 12*a^4*b*c*d*g^4*i) + (d^3*
atan((d^3*((a^4*d^4*g^4*i - b^4*c^4*g^4*i + 2*a*b^3*c^3*d*g^4*i - 2*a^3*b*c
*d^3*g^4*i)/(a^3*d^3*g^4*i - b^3*c^3*g^4*i + 3*a*b^2*c^2*d*g^4*i - 3*a^2*b*
c*d^2*g^4*i) + 2*b*d*x)*(A + (11*B*n)/6)*(a^3*d^3*g^4*i - b^3*c^3*g^4*i + 3
*a*b^2*c^2*d*g^4*i - 3*a^2*b*c*d^2*g^4*i)*6i)/(g^4*i*(6*A*d^3 + 11*B*d^3*n)
*(a*d - b*c)^4))*(A + (11*B*n)/6)*2i)/(g^4*i*(a*d - b*c)^4) - (B*d^3*log(e*
((a + b*x)/(c + d*x))^n)^2)/(2*g^4*i*n*(a*d - b*c)*(a^3*d^3 - b^3*c^3 + 3*a
*b^2*c^2*d - 3*a^2*b*c*d^2)) + (B*d^3*log(e*((a + b*x)/(c + d*x))^n)*(x*(b*
((g^4*i*n*(a*d - b*c)*(3*a*d - b*c))/(6*d^2) + (a*g^4*i*n*(a*d - b*c))/(3*d
```

```
)) + (2*a*b*g^4*i*n*(a*d - b*c))/(3*d) + (b*g^4*i*n*(a*d - b*c)*(3*a*d - b*
c))/(3*d^2)) + a*((g^4*i*n*(a*d - b*c)*(3*a*d - b*c))/(6*d^2) + (a*g^4*i*n*
(a*d - b*c))/(3*d)) + (g^4*i*n*(a*d - b*c)*(3*a^2*d^2 + b^2*c^2 - 3*a*b*c*d
))/(3*d^3) + (b^2*g^4*i*n*x^2*(a*d - b*c))/d))/(g^4*i*n*(a*d - b*c)*(a^3*d^
3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)*(a^3*g^4*i + b^3*g^4*i*x^3 + 3
*a^2*b*g^4*i*x + 3*a*b^2*g^4*i*x^2))
```

3.143 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=359

$$\frac{3B(bc-ad)^2g^3n(a+bx)}{d^3i^2(c+dx)}-\frac{(bc-ad)^2g^3(6A+5Bn)(a+bx)}{2d^3i^2(c+dx)}-\frac{3B(bc-ad)^2g^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^3i^2(c+dx)}+\frac{g^3(a$$

```
[Out] 3*B*(-a*d+b*c)^2*g^3*n*(b*x+a)/d^3/i^2/(d*x+c)-1/2*(-a*d+b*c)^2*g^3*(5*B*n+
6*A)*(b*x+a)/d^3/i^2/(d*x+c)-3*B*(-a*d+b*c)^2*g^3*(b*x+a)*ln(e*((b*x+a)/(d*
x+c))^n)/d^3/i^2/(d*x+c)+1/2*g^3*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/
d/i^2/(d*x+c)-1/2*(-a*d+b*c)*g^3*(b*x+a)^2*(3*A+B*n+3*B*ln(e*((b*x+a)/(d*x+
c))^n))/d^2/i^2/(d*x+c)-1/2*b*(-a*d+b*c)^2*g^3*(6*A+5*B*n+6*B*ln(e*((b*x+a)
/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/d^4/i^2-3*b*B*(-a*d+b*c)^2*g^3*n*pol
ylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i^2
```

Rubi [A]
time = 0.28, antiderivative size = 359, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.163, Rules used = {2561, 2384, 45, 2393, 2332, 2354, 2438}

$$-\frac{3bBg^3n(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^2}-\frac{bg^3(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+5Bn\right)}{2d^4i^2}-\frac{g^3(a+bx)(6A+5Bn)(bc-ad)^2}{2d^3i^2(c+dx)}-\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{2d^2i^2(c+dx)}+\frac{g^3(a+bx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2di^2(c+dx)}-\frac{3Bg^3(a+bx)(bc-ad)^2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^3i^2(c+dx)}+\frac{3Bg^3n(a+bx)(bc-ad)^2}{d^3i^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^
2,x]
```

```
[Out] (3*B*(b*c - a*d)^2*g^3*n*(a + b*x))/(d^3*i^2*(c + d*x)) - ((b*c - a*d)^2*g^
3*(6*A + 5*B*n)*(a + b*x))/(2*d^3*i^2*(c + d*x)) - (3*B*(b*c - a*d)^2*g^3*(
a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^3*i^2*(c + d*x)) + (g^3*(a + b*
x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i^2*(c + d*x)) - ((b*c -
a*d)*g^3*(a + b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d
^2*i^2*(c + d*x)) - (b*(b*c - a*d)^2*g^3*(6*A + 5*B*n + 6*B*Log[e*((a + b*x
)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(2*d^4*i^2) - (3*b*B*(b*c
- a*d)^2*g^3*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(143c+143dx)^2}\,dx = \int \left(-\frac{b^2(2bc-3ad)g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{20449d^3} + \frac{b^3g^3x(A+B\right.$$

$$= \frac{(b^3g^3)\int x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{20449d^2} - \frac{(b^2(2bc-3ad)g^3)\int (A}{}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{20449d^3} + \frac{b^3g^3x^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{40898d^2} + \frac{(bc-}{}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{20449d^3} - \frac{bB(2bc-3ad)g^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.}{20449d^3}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{20449d^3} - \frac{bB(2bc-3ad)g^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.}{20449d^3}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{20449d^3} - \frac{b^2B(bc-ad)g^3nx}{40898d^3} - \frac{B(bc-ad)^3g^3n}{20449d^4(c+dx)}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{20449d^3} - \frac{b^2B(bc-ad)g^3nx}{40898d^3} - \frac{B(bc-ad)^3g^3n}{20449d^4(c+dx)}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{20449d^3} - \frac{b^2B(bc-ad)g^3nx}{40898d^3} - \frac{B(bc-ad)^3g^3n}{20449d^4(c+dx)}$$

Mathematica [A]
time = 0.30, size = 375, normalized size = 1.04

$$\frac{g^3\left(-2Ab^2d(2bc-3ad)x-2bBd(2bc-3ad)(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+b^3d^2x^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+\frac{2(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{c+dx}+2bB(2bc-3ad)(bc-ad)n\log(c+dx)+6b(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)-2B(bc-ad)^2n\left(\frac{bc-ad}{c+dx}+b\log(a+bx)-b\log(c+dx)\right)+bBn\left(-a^2d^2\log(a+bx)+b(d(-bc+ad)x+bc^2\log(c+dx))\right)-3bB(bc-ad)^2n\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{2d^4i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x)^2,x]
```

```
[Out] (g^3*(-2*A*b^2*d*(2*b*c - 3*a*d)*x - 2*b*B*d*(2*b*c - 3*a*d)*(a + b*x)*Log[
e*((a + b*x)/(c + d*x))^n] + b^3*d^2*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]) + (2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) +
 2*b*B*(2*b*c - 3*a*d)*(b*c - a*d)*n*Log[c + d*x] + 6*b*(b*c - a*d)^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*B*(b*c - a*d)^2*n*((b*c
- a*d)/(c + d*x) + b*Log[a + b*x] - b*Log[c + d*x]) + b*B*n*(-(a^2*d^2*Log[
a + b*x]) + b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*b*B*(b*c - a*d
)^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(2*d^4*i^2)
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1721 vs. $2(333) = 666$.
time = 0.57, size = 1721, normalized size = 4.79

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] -B*a^3*g^3*n*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^
2) + 1/(d^2*x + c*d)) - 1/2*(2*c^3/(d^5*x + c*d^4) + 6*c^2*log(d*x + c)/d^4
 + (d*x^2 - 4*c*x)/d^3)*A*b^3*g^3 + 3*A*a*b^2*(c^2/(d^4*x + c*d^3) - x/d^2
+ 2*c*log(d*x + c)/d^3)*g^3 - 3*A*a^2*b*g^3*(c/(d^3*x + c*d^2) + log(d*x +
c)/d^2) + B*a^3*g^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(d^2*x + c*d) +
A*a^3*g^3/(d^2*x + c*d) + 1/2*(a*b^3*c^2*d*g^3*(17*n + 18) - b^4*c^3*g^3*(7
*n + 6) - 6*a^2*b^2*c*d^2*g^3*(2*n + 3) + 6*a^3*b*d^3*g^3)*B*log(d*x + c)/(
b*c*d^4 - a*d^5) - 1/2*((b^4*c*d^3*g^3 - a*b^3*d^4*g^3)*B*x^3 + (a*b^3*c*d^
3*g^3*(2*n + 9) - a^2*b^2*d^4*g^3*(n + 6) - b^4*c^2*d^2*g^3*(n + 3))*B*x^2
- (a^2*b^2*c*d^3*g^3*(n + 6) - 2*a*b^3*c^2*d^2*g^3*(n + 5) + b^4*c^3*d*g^3*
(n + 4))*B*x - 6*((b^4*c^3*d*g^3*n - 3*a*b^3*c^2*d^2*g^3*n + 3*a^2*b^2*c*d^
3*g^3*n - a^3*b*d^4*g^3*n)*B*x + (b^4*c^4*g^3*n - 3*a*b^3*c^3*d*g^3*n + 3*a
^2*b^2*c^2*d^2*g^3*n - a^3*b*c*d^3*g^3*n)*B)*log(b*x + a)*log(d*x + c) + 3*
((b^4*c^3*d*g^3*n - 3*a*b^3*c^2*d^2*g^3*n + 3*a^2*b^2*c*d^3*g^3*n - a^3*b*d
^4*g^3*n)*B*x + (b^4*c^4*g^3*n - 3*a*b^3*c^3*d*g^3*n + 3*a^2*b^2*c^2*d^2*g^
3*n - a^3*b*c*d^3*g^3*n)*B)*log(d*x + c)^2 - 2*(b^4*c^4*g^3*(n - 1) - 4*a*b
^3*c^3*d*g^3*(n - 1) + 6*a^2*b^2*c^2*d^2*g^3*(n - 1) - 3*a^3*b*c*d^3*g^3*(n
 - 1))*B - ((2*b^4*c^3*d*g^3*n - 2*a*b^3*c^2*d^2*g^3*n - 3*a^2*b^2*c*d^3*g^
3*n + 5*a^3*b*d^4*g^3*n)*B*x + (2*b^4*c^4*g^3*n - 2*a*b^3*c^3*d*g^3*n - 3*a
^2*b^2*c^2*d^2*g^3*n + 5*a^3*b*c*d^3*g^3*n)*B)*log(b*x + a) + ((b^4*c*d^3*g
^3 - a*b^3*d^4*g^3)*B*x^3 - 3*(b^4*c^2*d^2*g^3 - 3*a*b^3*c*d^3*g^3 + 2*a^2*
b^2*d^4*g^3)*B*x^2 - 2*(2*b^4*c^3*d*g^3 - 5*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c
*d^3*g^3)*B*x + 2*(b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3
- 3*a^3*b*c*d^3*g^3)*B + 6*((b^4*c^3*d*g^3 - 3*a*b^3*c^2*d^2*g^3 + 3*a^2*b^
```

```
2*c*d^3*g^3 - a^3*b*d^4*g^3)*B*x + (b^4*c^4*g^3 - 3*a*b^3*c^3*d*g^3 + 3*a^2
*b^2*c^2*d^2*g^3 - a^3*b*c*d^3*g^3)*B)*log(d*x + c))*log((b*x + a)^n) - ((b
^4*c*d^3*g^3 - a*b^3*d^4*g^3)*B*x^3 - 3*(b^4*c^2*d^2*g^3 - 3*a*b^3*c*d^3*g^
3 + 2*a^2*b^2*d^4*g^3)*B*x^2 - 2*(2*b^4*c^3*d*g^3 - 5*a*b^3*c^2*d^2*g^3 + 3
*a^2*b^2*c*d^3*g^3)*B*x + 2*(b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^
2*d^2*g^3 - 3*a^3*b*c*d^3*g^3)*B + 6*((b^4*c^3*d*g^3 - 3*a*b^3*c^2*d^2*g^3
+ 3*a^2*b^2*c*d^3*g^3 - a^3*b*d^4*g^3)*B*x + (b^4*c^4*g^3 - 3*a*b^3*c^3*d*g
^3 + 3*a^2*b^2*c^2*d^2*g^3 - a^3*b*c*d^3*g^3)*B)*log(d*x + c))*log((d*x + c
)^n))/(b*c^2*d^4 - a*c*d^5 + (b*c*d^5 - a*d^6)*x) - 3*(b^3*c^2*g^3*n - 2*a*
b^2*c*d*g^3*n + a^2*b*d^2*g^3*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d
) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/d^4
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] integral(-((A + B)*b^3*g^3*x^3 + 3*(A + B)*a*b^2*g^3*x^2 + 3*(A + B)*a^2*b*
g^3*x + (A + B)*a^3*g^3 + (B*b^3*g^3*n*x^3 + 3*B*a*b^2*g^3*n*x^2 + 3*B*a^2*
b*g^3*n*x + B*a^3*g^3*n)*log((b*x + a)/(d*x + c)))/(d^2*x^2 + 2*c*d*x + c^2
), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 2988 vs. $2(333) = 666$.
time = 269.84, size = 2988, normalized size = 8.32

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

[Out] 1/24*(6*(B*b^8*c^5*g^3*n - 5*B*a*b^7*c^4*d*g^3*n - 4*(b*x + a)*B*b^7*c^5*d*g^3*n/(d*x + c) + 10*B*a^2*b^6*c^3*d^2*g^3*n + 20*(b*x + a)*B*a*b^6*c^4*d^2*g^3*n/(d*x + c) + 6*(b*x + a)^2*B*b^6*c^5*d^2*g^3*n/(d*x + c)^2 - 10*B*a^3*b^5*c^2*d^3*g^3*n - 40*(b*x + a)*B*a^2*b^5*c^3*d^3*g^3*n/(d*x + c) - 30*(b*x + a)^2*B*a*b^5*c^4*d^3*g^3*n/(d*x + c)^2 - 4*(b*x + a)^3*B*b^5*c^5*d^3*g^3*n/(d*x + c)^3 + 5*B*a^4*b^4*c*d^4*g^3*n + 40*(b*x + a)*B*a^3*b^4*c^2*d^4*g^3*n/(d*x + c) + 60*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^3*n/(d*x + c)^2 + 20*(b*x + a)^3*B*a*b^4*c^4*d^4*g^3*n/(d*x + c)^3 - B*a^5*b^3*d^5*g^3*n - 20*(b*x + a)*B*a^4*b^3*c*d^5*g^3*n/(d*x + c) - 60*(b*x + a)^2*B*a^3*b^3*c^2*d^5*g^3*n/(d*x + c)^2 - 40*(b*x + a)^3*B*a^2*b^3*c^3*d^5*g^3*n/(d*x + c)^3 + 4*(b*x + a)*B*a^5*b^2*d^6*g^3*n/(d*x + c) + 30*(b*x + a)^2*B*a^4*b^2*c*d^6*g^3*n/(d*x + c)^2 + 40*(b*x + a)^3*B*a^3*b^2*c^2*d^6*g^3*n/(d*x + c)^3 - 6*(b*x + a)^2*B*a^5*b*d^7*g^3*n/(d*x + c)^2 - 20*(b*x + a)^3*B*a^4*b*c*d^7*g^3*n/(d*x + c)^3 + 4*(b*x + a)^3*B*a^5*d^8*g^3*n/(d*x + c)^3)*log((b*x + a)/(d*x + c))/(b^4*d^4 - 4*(b*x + a)*b^3*d^5/(d*x + c) + 6*(b*x + a)^2*b^2*d^6/(d*x + c)^2 - 4*(b*x + a)^3*b*d^7/(d*x + c)^3 + (b*x + a)^4*d^8/(d*x + c)^4) + (11*B*b^8*c^5*g^3*n - 55*B*a*b^7*c^4*d*g^3*n - 38*(b*x + a)*B*b^7*c^5*d*g^3*n/(d*x + c) + 110*B*a^2*b^6*c^3*d^2*g^3*n + 190*(b*x + a)*B*a*b^6*c^4*d^2*g^3*n/(d*x + c) + 45*(b*x + a)^2*B*b^6*c^5*d^2*g^3*n/(d*x + c)^2 - 110*B*a^3*b^5*c^2*d^3*g^3*n - 380*(b*x + a)*B*a^2*b^5*c^3*d^3*g^3*n/(d*x + c) - 225*(b*x + a)^2*B*a*b^5*c^4*d^3*g^3*n/(d*x + c)^2 - 18*(b*x + a)^3*B*b^5*c^5*d^3*g^3*n/(d*x + c)^3 + 55*B*a^4*b^4*c*d^4*g^3*n + 380*(b*x + a)*B*a^3*b^4*c^2*d^4*g^3*n/(d*x + c) + 450*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^3*n/(d*x + c)^2 + 90*(b*x + a)^3*B*a*b^4*c^4*d^4*g^3*n/(d*x + c)^3 - 11*B*a^5*b^3*d^5*g^3*n - 190*(b*x + a)*B*a^4*b^3*c*d^5*g^3*n/(d*x + c) - 450*(b*x + a)^2*B*a^3*b^3*c^2*d^5*g^3*n/(d*x + c)^2 - 180*(b*x + a)^3*B*a^2*b^3*c^3*d^5*g^3*n/(d*x + c)^3 + 38*(b*x + a)*B*a^5*b^2*d^6*g^3*n/(d*x + c) + 225*(b*x + a)^2*B*a^4*b^2*c*d^6*g^3*n/(d*x + c)^2 + 180*(b*x + a)^3*B*a^3*b^2*c^2*d^6*g^3*n/(d*x + c)^3 - 45*(b*x + a)^2*B*a^5*b*d^7*g^3*n/(d*x + c)^2 - 90*(b*x + a)^3*B*a^4*b*c*d^7*g^3*n/(d*x + c)^3 + 18*(b*x + a)^3*B*a^5*d^8*g^3*n/(d*x + c)^3 + 6*A*b^8*c^5*g^3 + 6*B*b^8*c^5*g^3 - 30*A*a*b^7*c^4*d*g^3 - 30*B*a*b^7*c^4*d*g^3 - 24*(b*x + a)*A*b^7*c^5*d*g^3/(d*x + c) - 24*(b*x + a)*B*b^7*c^5*d*g^3/(d*x + c) + 60*A*a^2*b^6*c^3*d^2*g^3 + 60*B*a^2*b^6*c^3*d^2*g^3 + 120*(b*x + a)*A*a*b^6*c^4*d^2*g^3/(d*x + c) + 120*(b*x + a)*B*a*b^6*c^4*d^2*g^3/(d*x + c) + 36*(b*x + a)^2*A*b^6*c^5*d^2*g^3/(d*x + c)^2 + 36*(b*x + a)^2*B*b^6*c^5*d^2*g^3/(d*x + c)^2 - 60*A*a^3*b^5*c^2*d^3*g^3 - 60*B*a^3*b^5*c^2*d^3*g^3 - 240*(b*x + a)*A*a^2*b^5*c^3*d^3*g^3/(d*x + c) - 240*(b*x + a)*B*a^2*b^5*c^3*d^3*g^3/(d*x + c) - 180*(b*x + a)^2*A*a*b^5*c^4*d^3*g^3/(d*x + c)^2 - 180*(b*x + a)^2*B*a*b^5*c^4*d^3*g^3/(d*x + c)^2 - 24*(b*x + a)^3*A*b^5*c^5*d^3*g^3/(d*x + c)^3 - 24*(b*x + a)^3*B*b^5*c^5*d^3*g^3/(d*x + c)^3 + 30*A*a^4*b^4*c*d^4*g^3 + 30*B*a^4*b^4*c*d^4*g^3 + 240*(b*x + a)*A*a^3*b^4*c^2*d^4*g^3/(d*x + c) + 240*(b*x + a)*B*a^3*b^4*c^2*d^4*g^3/(d*x + c) + 360*(b*x + a)^2*A*a^2*b^4*c^3*d^4*g^3/(d*x + c)^2 + 360*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^3/(d*x + c)^2 + 120*(b*x + a)^3*A*a*b^4*c^4*d^4*g^3/(d*x + c)^3 + 120*(b*x + a)^3*B*a*b^4*c^4*d^4*g^3/(d*x + c)^3 - 6*A*a^5*b^3*d^5*g^3 -

```
6*B*a^5*b^3*d^5*g^3 - 120*(b*x + a)*A*a^4*b^3*c*d^5*g^3/(d*x + c) - 120*(b
*x + a)*B*a^4*b^3*c*d^5*g^3/(d*x + c) - 360*(b*x + a)^2*A*a^3*b^3*c^2*d^5*g
^3/(d*x + c)^2 - 360*(b*x + a)^2*B*a^3*b^3*c^2*d^5*g^3/(d*x + c)^2 - 240*(b
*x + a)^3*A*a^2*b^3*c^3*d^5*g^3/(d*x + c)^3 - 240*(b*x + a)^3*B*a^2*b^3*c^3
*d^5*g^3/(d*x + c)^3 + 24*(b*x + a)*A*a^5*b^2*d^6*g^3/(d*x + c) + 24*(b*x +
 a)*B*a^5*b^2*d^6*g^3/(d*x + c) + 180*(b*x + a)^2*A*a^4*b^2*c*d^6*g^3/(d*x
+ c)^2 + 180*(b*x + a)^2*B*a^4*b^2*c*d^6*g^3/(d*x + c)^2 + 240*(b*x + a)^3*
A*a^3*b^2*c^2*d^6*g^3/(d*x + c)^3 + 240*(b*x + a)^3*B*a^3*b^2*c^2*d^6*g^3/(
d*x + c)^3 - 36*(b*x + a)^2*A*a^5*b*d^7*g^3/(d*x + c)^2 - 36*(b*x + a)^2*B*
a^5*b*d^7*g^3/(d*x + c)^2 - 120*(b*x + a)^3*A*a^4*b*c*d^7*g^3/(d*x + c)^3 -
 120*(b*x + a)^3*B*a^4*b*c*d^7*g^3/(d*x + c)^3 + 24*(b*x + a)^3*A*a^5*d^8*g
^3/(d*x + c)^3 + 24*(b*x + a)^3*B*a^5*d^8*g^3/(d*x + c)^3)/(b^4*d^4 - 4*(b*
x + a)*b^3*d^5/(d*x + c) + 6*(b*x + a)^2*b^2*d^6/(d*x + c)^2 - 4*(b*x + a)^
3*b*d^7/(d*x + c)^3 + (b*x + a)^4*d^8/(d*x + c)^4) + 6*(B*b^5*c^5*g^3*n - 5
*B*a*b^4*c^4*d*g^3*n + 10*B*a^2*b^3*c^3*d^2*g^3*n - 10*B*a^3*b^2*c^2*d^3*g^
3*n + 5*B*a^4*b*c*d^4*g^3*n - B*a^5*d^5*g^3*n)*log(-b + (b*x + a)*d/(d*x +
c))/(b*d^4) - 6*(B*b^5*c^5*g^3*n - 5*B*a*b^4*c^4*d*g^3*n + 10*B*a^2*b^3*c^3
*d^2*g^3*n - 10*B*a^3*b^2*c^2*d^3*g^3*n + 5*B*a^4*b*c*d^4*g^3*n - B*a^5*d^5
*g^3*n)*log((b*x + a)/(d*x + c))/(b*d^4))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a
*d)^2)^2
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{(c\,i+d\,i\,x)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
2,x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
2, x)
```

3.144 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=275

$$-\frac{2B(bc-ad)g^2n(a+bx)}{d^2i^2(c+dx)}+\frac{(bc-ad)g^2(2A+Bn)(a+bx)}{d^2i^2(c+dx)}+\frac{2B(bc-ad)g^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^2i^2(c+dx)}+\frac{g^2(a-$$

```
[Out] -2*B*(-a*d+b*c)*g^2*n*(b*x+a)/d^2/i^2/(d*x+c)+(-a*d+b*c)*g^2*(B*n+2*A)*(b*x
+a)/d^2/i^2/(d*x+c)+2*B*(-a*d+b*c)*g^2*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/d^
2/i^2/(d*x+c)+g^2*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d/i^2/(d*x+c)+b
*(-a*d+b*c)*g^2*(2*A+B*n+2*B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*
x+c))/d^3/i^2+2*b*B*(-a*d+b*c)*g^2*n*polylog(2,d*(b*x+a)/b/(d*x+c))/d^3/i^2
```

Rubi [A]
time = 0.21, antiderivative size = 275, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.163$, Rules used = {2561, 2384, 45, 2393, 2332, 2354, 2438}

$$\frac{2bBg^2n(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}+\frac{bg^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+Bn\right)}{d^3i^2}+\frac{g^2(a+bx)(2A+Bn)(bc-ad)}{d^2i^2(c+dx)}+\frac{g^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di^2(c+dx)}+\frac{2Bg^2(a+bx)(bc-ad)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^2i^2(c+dx)}-\frac{2Bg^2n(a+bx)(bc-ad)}{d^2i^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^
2,x]
```

```
[Out] (-2*B*(b*c - a*d)*g^2*n*(a + b*x))/(d^2*i^2*(c + d*x)) + ((b*c - a*d)*g^2*(
2*A + B*n)*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B*(b*c - a*d)*g^2*(a + b*x)*
Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i^2*(c + d*x)) + (g^2*(a + b*x)^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(d*i^2*(c + d*x)) + (b*(b*c - a*d)*g^2*
(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*
x))])/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^2*n*PolyLog[2, (d*(a + b*x))/(b*(c +
 d*x))])/(d^3*i^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(144c+144dx)^2}\,dx = \int \left(\frac{b^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{20736d^2} + \frac{(-bc+ad)^2g^2\left(A+B\log\right.}{20736d^2(c+dx}\right.$$

$$= \frac{(b^2g^2)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{20736d^2} - \frac{(b(bc-ad)g^2)\int\frac{A+B\log}{}}{10368d^2}$$

$$= \frac{Ab^2g^2x}{20736d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{20736d^3(c+dx)} - \frac{b(bc-ad)g}{}$$

$$= \frac{Ab^2g^2x}{20736d^2} + \frac{bBg^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{20736d^2} - \frac{(bc-ad)^2g^2(A+}{20736d^3(}$$

$$= \frac{Ab^2g^2x}{20736d^2} + \frac{bBg^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{20736d^2} - \frac{(bc-ad)^2g^2(A+}{20736d^3(}$$

$$= \frac{Ab^2g^2x}{20736d^2} + \frac{B(bc-ad)^2g^2n}{20736d^3(c+dx)} + \frac{bB(bc-ad)g^2n\log(a+bx)}{20736d^3} +$$

$$= \frac{Ab^2g^2x}{20736d^2} + \frac{B(bc-ad)^2g^2n}{20736d^3(c+dx)} + \frac{bB(bc-ad)g^2n\log(a+bx)}{20736d^3} +$$

$$= \frac{Ab^2g^2x}{20736d^2} + \frac{B(bc-ad)^2g^2n}{20736d^3(c+dx)} + \frac{bB(bc-ad)g^2n\log(a+bx)}{20736d^3} +$$

Mathematica [A]
time = 0.17, size = 252, normalized size = 0.92

$$\frac{g^2\left(Ab^2dx + \frac{B(bc-ad)^2n}{c+dx} + bB(bc-ad)n\log(a+bx) + bBd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) - \frac{(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{c+dx} - 2bB(bc-ad)n\log(c+dx) - 2b(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx) + bB(bc-ad)n\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right) - \log(c+dx)\right)\log(c+dx) + 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{d^3i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x)^2,x]
```

```
[Out] (g^2*(A*b^2*d*x + (B*(b*c - a*d)^2*n)/(c + d*x) + b*B*(b*c - a*d)*n*Log[a +
 b*x] + b*B*d*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - ((b*c - a*d)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) - 2*b*B*(b*c - a*d)*n*Log[c
+ d*x] - 2*b*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x
] + b*B*(b*c - a*d)*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])
*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(d^3*i^2)
```

Maple [F]

time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1163 vs. 2(262) = 524.
time = 0.55, size = 1163, normalized size = 4.23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] -B*a^2*g^2*n*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^
2) + 1/(d^2*x + c*d)) + A*b^2*(c^2/(d^4*x + c*d^3) - x/d^2 + 2*c*log(d*x +
c)/d^3)*g^2 - 2*A*a*b*g^2*(c/(d^3*x + c*d^2) + log(d*x + c)/d^2) + B*a^2*g^
2*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(d^2*x + c*d) + A*a^2*g^2/(d^2*x +
 c*d) - (a*b^2*c*d*g^2*(3*n + 4) - 2*b^3*c^2*g^2*(n + 1) - 2*a^2*b*d^2*g^2)
*B*log(d*x + c)/(b*c*d^3 - a*d^4) - ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2
+ (b^3*c^2*d*g^2 - a*b^2*c*d^2*g^2)*B*x + 2*((b^3*c^2*d*g^2*n - 2*a*b^2*c*d
^2*g^2*n + a^2*b*d^3*g^2*n)*B*x + (b^3*c^3*g^2*n - 2*a*b^2*c^2*d*g^2*n + a^
2*b*c*d^2*g^2*n)*B)*log(b*x + a)*log(d*x + c) - ((b^3*c^2*d*g^2*n - 2*a*b^2
*c*d^2*g^2*n + a^2*b*d^3*g^2*n)*B*x + (b^3*c^3*g^2*n - 2*a*b^2*c^2*d*g^2*n
+ a^2*b*c*d^2*g^2*n)*B)*log(d*x + c)^2 + (b^3*c^3*g^2*(n - 1) - 3*a*b^2*c^2
*d*g^2*(n - 1) + 2*a^2*b*c*d^2*g^2*(n - 1))*B + ((b^3*c^2*d*g^2*n - a*b^2*c
*d^2*g^2*n - a^2*b*d^3*g^2*n)*B*x + (b^3*c^3*g^2*n - a*b^2*c^2*d*g^2*n - a^
2*b*c*d^2*g^2*n)*B)*log(b*x + a) + ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 +
 (b^3*c^2*d*g^2 - a*b^2*c*d^2*g^2)*B*x - (b^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 +
 2*a^2*b*c*d^2*g^2)*B - 2*((b^3*c^2*d*g^2 - 2*a*b^2*c*d^2*g^2 + a^2*b*d^3*g
^2)*B*x + (b^3*c^3*g^2 - 2*a*b^2*c^2*d*g^2 + a^2*b*c*d^2*g^2)*B)*log(d*x +
c))*log((b*x + a)^n) - ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 + (b^3*c^2*d*
g^2 - a*b^2*c*d^2*g^2)*B*x - (b^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 2*a^2*b*c*d
^2*g^2)*B - 2*((b^3*c^2*d*g^2 - 2*a*b^2*c*d^2*g^2 + a^2*b*d^3*g^2)*B*x + (b
^3*c^3*g^2 - 2*a*b^2*c^2*d*g^2 + a^2*b*c*d^2*g^2)*B)*log(d*x + c))*log((d*x
 + c)^n))/(b*c^2*d^3 - a*c*d^4 + (b*c*d^4 - a*d^5)*x) + 2*(b^2*c*g^2*n - a*
b*d*g^2*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x
 + a*d)/(b*c - a*d)))*B/d^3
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] integral(-((A + B)*b^2*g^2*x^2 + 2*(A + B)*a*b*g^2*x + (A + B)*a^2*g^2 + (B
*b^2*g^2*n*x^2 + 2*B*a*b*g^2*n*x + B*a^2*g^2*n)*log((b*x + a)/(d*x + c)))/(
d^2*x^2 + 2*c*d*x + c^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 1838 vs. 2(262) = 524.
time = 196.84, size = 1838, normalized size = 6.68

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] -1/6*(2*(B*b^6*c^4*g^2*n - 4*B*a*b^5*c^3*d*g^2*n - 3*(b*x + a)*B*b^5*c^4*d*
g^2*n/(d*x + c) + 6*B*a^2*b^4*c^2*d^2*g^2*n + 12*(b*x + a)*B*a*b^4*c^3*d^2*
g^2*n/(d*x + c) + 3*(b*x + a)^2*B*b^4*c^4*d^2*g^2*n/(d*x + c)^2 - 4*B*a^3*b
^3*c*d^3*g^2*n - 18*(b*x + a)*B*a^2*b^3*c^2*d^3*g^2*n/(d*x + c) - 12*(b*x +
 a)^2*B*a*b^3*c^3*d^3*g^2*n/(d*x + c)^2 + B*a^4*b^2*d^4*g^2*n + 12*(b*x + a
)*B*a^3*b^2*c*d^4*g^2*n/(d*x + c) + 18*(b*x + a)^2*B*a^2*b^2*c^2*d^4*g^2*n/
(d*x + c)^2 - 3*(b*x + a)*B*a^4*b*d^5*g^2*n/(d*x + c) - 12*(b*x + a)^2*B*a^
3*b*c*d^5*g^2*n/(d*x + c)^2 + 3*(b*x + a)^2*B*a^4*d^6*g^2*n/(d*x + c)^2)*lo
g((b*x + a)/(d*x + c))/(b^3*d^3 - 3*(b*x + a)*b^2*d^4/(d*x + c) + 3*(b*x +
a)^2*b*d^5/(d*x + c)^2 - (b*x + a)^3*d^6/(d*x + c)^3) + (3*B*b^6*c^4*g^2*n
- 12*B*a*b^5*c^3*d*g^2*n - 7*(b*x + a)*B*b^5*c^4*d*g^2*n/(d*x + c) + 18*B*a
^2*b^4*c^2*d^2*g^2*n + 28*(b*x + a)*B*a*b^4*c^3*d^2*g^2*n/(d*x + c) + 4*(b*
```

```
x + a)^2*B*b^4*c^4*d^2*g^2*n/(d*x + c)^2 - 12*B*a^3*b^3*c*d^3*g^2*n - 42*(b
*x + a)*B*a^2*b^3*c^2*d^3*g^2*n/(d*x + c) - 16*(b*x + a)^2*B*a*b^3*c^3*d^3*
g^2*n/(d*x + c)^2 + 3*B*a^4*b^2*d^4*g^2*n + 28*(b*x + a)*B*a^3*b^2*c*d^4*g^
2*n/(d*x + c) + 24*(b*x + a)^2*B*a^2*b^2*c^2*d^4*g^2*n/(d*x + c)^2 - 7*(b*x
 + a)*B*a^4*b*d^5*g^2*n/(d*x + c) - 16*(b*x + a)^2*B*a^3*b*c*d^5*g^2*n/(d*x
 + c)^2 + 4*(b*x + a)^2*B*a^4*d^6*g^2*n/(d*x + c)^2 + 2*A*b^6*c^4*g^2 + 2*B
*b^6*c^4*g^2 - 8*A*a*b^5*c^3*d*g^2 - 8*B*a*b^5*c^3*d*g^2 - 6*(b*x + a)*A*b^
5*c^4*d*g^2/(d*x + c) - 6*(b*x + a)*B*b^5*c^4*d*g^2/(d*x + c) + 12*A*a^2*b^
4*c^2*d^2*g^2 + 12*B*a^2*b^4*c^2*d^2*g^2 + 24*(b*x + a)*A*a*b^4*c^3*d^2*g^2
/(d*x + c) + 24*(b*x + a)*B*a*b^4*c^3*d^2*g^2/(d*x + c) + 6*(b*x + a)^2*A*b
^4*c^4*d^2*g^2/(d*x + c)^2 + 6*(b*x + a)^2*B*b^4*c^4*d^2*g^2/(d*x + c)^2 -
8*A*a^3*b^3*c*d^3*g^2 - 8*B*a^3*b^3*c*d^3*g^2 - 36*(b*x + a)*A*a^2*b^3*c^2*
d^3*g^2/(d*x + c) - 36*(b*x + a)*B*a^2*b^3*c^2*d^3*g^2/(d*x + c) - 24*(b*x
+ a)^2*A*a*b^3*c^3*d^3*g^2/(d*x + c)^2 - 24*(b*x + a)^2*B*a*b^3*c^3*d^3*g^2
/(d*x + c)^2 + 2*A*a^4*b^2*d^4*g^2 + 2*B*a^4*b^2*d^4*g^2 + 24*(b*x + a)*A*a
^3*b^2*c*d^4*g^2/(d*x + c) + 24*(b*x + a)*B*a^3*b^2*c*d^4*g^2/(d*x + c) + 3
6*(b*x + a)^2*A*a^2*b^2*c^2*d^4*g^2/(d*x + c)^2 + 36*(b*x + a)^2*B*a^2*b^2*
c^2*d^4*g^2/(d*x + c)^2 - 6*(b*x + a)*A*a^4*b*d^5*g^2/(d*x + c) - 6*(b*x +
a)*B*a^4*b*d^5*g^2/(d*x + c) - 24*(b*x + a)^2*A*a^3*b*c*d^5*g^2/(d*x + c)^2
 - 24*(b*x + a)^2*B*a^3*b*c*d^5*g^2/(d*x + c)^2 + 6*(b*x + a)^2*A*a^4*d^6*g
^2/(d*x + c)^2 + 6*(b*x + a)^2*B*a^4*d^6*g^2/(d*x + c)^2)/(b^3*d^3 - 3*(b*x
 + a)*b^2*d^4/(d*x + c) + 3*(b*x + a)^2*b*d^5/(d*x + c)^2 - (b*x + a)^3*d^6
/(d*x + c)^3) + 2*(B*b^4*c^4*g^2*n - 4*B*a*b^3*c^3*d*g^2*n + 6*B*a^2*b^2*c^
2*d^2*g^2*n - 4*B*a^3*b*c*d^3*g^2*n + B*a^4*d^4*g^2*n)*log(b - (b*x + a)*d/
(d*x + c))/(b*d^3) - 2*(B*b^4*c^4*g^2*n - 4*B*a*b^3*c^3*d*g^2*n + 6*B*a^2*b
^2*c^2*d^2*g^2*n - 4*B*a^3*b*c*d^3*g^2*n + B*a^4*d^4*g^2*n)*log((b*x + a)/(
d*x + c))/(b*d^3))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)^2
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^2\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{(c\,i+d\,i\,x)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
2,x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
2, x)
```

3.145 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=168

$$-\frac{Ag(a+bx)}{di^2(c+dx)}+\frac{Bgn(a+bx)}{di^2(c+dx)}-\frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{di^2(c+dx)}-\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)}{d^2i^2}-\frac{bBgn\mathrm{I}}{}$$

```
[Out] -A*g*(b*x+a)/d/i^2/(d*x+c)+B*g*n*(b*x+a)/d/i^2/(d*x+c)-B*g*(b*x+a)*ln(e*((b
*x+a)/(d*x+c))^n)/d/i^2/(d*x+c)-b*g*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*
d+b*c)/b/(d*x+c))/d^2/i^2-b*B*g*n*polylog(2,d*(b*x+a)/b/(d*x+c))/d^2/i^2
```

Rubi [A]
time = 0.11, antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.146$, Rules used = {2561, 45, 2393, 2332, 2354, 2438}

$$-\frac{bBgn\,\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2}-\frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i^2}-\frac{Ag(a+bx)}{di^2(c+dx)}-\frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{di^2(c+dx)}+\frac{Bgn(a+bx)}{di^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^2,
x]
```

```
[Out] -((A*g*(a + b*x))/(d*i^2*(c + d*x))) + (B*g*n*(a + b*x))/(d*i^2*(c + d*x))
- (B*g*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d*i^2*(c + d*x)) - (b*g*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^2*
i^2) - (b*B*g*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(145c+145dx)^2}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21025d(c+dx)^2} + \frac{bg\left(A+B\log\left(e\left(\frac{a-}{c+}\right.\right.\right.}{21025d(c+d}\right.$$

$$= \frac{(bg)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{21025d} - \frac{((bc-ad)g)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}\,d}{21025d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21025d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{21025d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21025d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{21025d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21025d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{21025d^2}$$

$$= -\frac{B(bc-ad)gn}{21025d^2(c+dx)} - \frac{bBgn\log(a+bx)}{21025d^2} + \frac{(bc-ad)g\left(A+B\,\mathrm{lo}\right.}{21025d^2(c+}$$

$$= -\frac{B(bc-ad)gn}{21025d^2(c+dx)} - \frac{bBgn\log(a+bx)}{21025d^2} + \frac{(bc-ad)g\left(A+B\,\mathrm{lo}\right.}{21025d^2(c+}$$

$$= -\frac{B(bc-ad)gn}{21025d^2(c+dx)} - \frac{bBgn\log(a+bx)}{21025d^2} + \frac{(bc-ad)g\left(A+B\,\mathrm{lo}\right.}{21025d^2(c+}$$

Mathematica [A]
time = 0.12, size = 183, normalized size = 1.09

$$\frac{g\left(\frac{2(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{c+dx}+2b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)-2Bn\left(\frac{bc-ad}{c+dx}+b\log(a+bx)-b\log(c+dx)\right)-bBn\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{2d^2i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i
*x)^2,x]
```

```
[Out] (g*((2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) + 2*b*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*B*n*((b*c - a*d)/(c
 + d*x) + b*Log[a + b*x] - b*Log[c + d*x]) - b*B*n*((2*Log[(d*(a + b*x))/(-
(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])))/(2*d^2*i^2)
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{\left(dix+ci\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] -B*a*g*n*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^2) +
 1/(d^2*x + c*d)) + 1/2*B*b*g*((2*(d*n*x + c*n)*log(b*x + a)*log(d*x + c) -
 (d*n*x + c*n)*log(d*x + c)^2 - 2*((d*x + c)*log(d*x + c) + c)*log((b*x + a
)^n) + 2*((d*x + c)*log(d*x + c) + c)*log((d*x + c)^n))/(d^3*x + c*d^2) - 2
*integrate((b*d^2*x^2 - b*c^2*n + a*c*d*n + a*d^2*x + (b*d^2*n*x^2 + a*c*d*
n + (b*c*d*n + a*d^2*n)*x)*log(b*x + a))/(b*d^4*x^3 + a*c^2*d^2 + (2*b*c*d^
3 + a*d^4)*x^2 + (b*c^2*d^2 + 2*a*c*d^3)*x), x)) - A*b*g*(c/(d^3*x + c*d^2)
 + log(d*x + c)/d^2) + B*a*g*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(d^2*x
+ c*d) + A*a*g/(d^2*x + c*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] integral(-((A + B)*b*g*x + (A + B)*a*g + (B*b*g*n*x + B*a*g*n)*log((b*x + a
)/(d*x + c)))/(d^2*x^2 + 2*c*d*x + c^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 866 vs. 2(151) = 302.
time = 126.45, size = 866, normalized size = 5.15

$$\frac{1}{2}\left(\frac{\left(Bb^4c^3gn - 3\,Bab^3c^2dgn - \frac{2\,(bx+a)Bb^3c^3dgn}{dx+c} + 3\,Ba^2b^2cd^2gn + \frac{6\,(bx+a)Bab^2c^2d^2gn}{dx+c} - Ba^3bd^3gn - \frac{6\,(bx+a)Ba^2bcd^3gn}{dx+c} + \frac{2\,(bx+a)Ba^3d^4gn}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)}{b^2d^2 - \frac{2\,(bx+a)bd^3}{dx+c} + \frac{(bx+a)^2d^4}{(dx+c)^2}} + \frac{Bb^4c^3gn - 3\,Bab^3c^2dgn - \frac{(bx+a)Bb^3c^3dgn}{dx+c} + 3\,Ba^2b^2cd^2gn + \frac{3\,(bx+a)Bab^2c^2d^2gn}{dx+c} - Ba^3bd^3gn - \frac{3\,(bx+a)Ba^2bcd^3gn}{dx+c} + \frac{(bx+a)Ba^3d^4gn}{dx+c} + Ab^4c^3g + Bb^4c^3g - 3\,Aab^3c^2dg - 3\,Bab^3c^2dg - \frac{2\,(bx+a)Ab^3c^3dg}{dx+c} - \frac{2\,(bx+a)Bb^3c^3dg}{dx+c} + 3\,Aa^2b^2cd^2g + 3\,Ba^2b^2cd^2g + \frac{6\,(bx+a)Aab^2c^2d^2g}{dx+c} + \frac{6\,(bx+a)Bab^2c^2d^2g}{dx+c} - Aa^3bd^3g - Ba^3bd^3g - \frac{6\,(bx+a)Aa^2bcd^3g}{dx+c} - \frac{6\,(bx+a)Ba^2bcd^3g}{dx+c} + \frac{2\,(bx+a)Aa^3d^4g}{dx+c} + \frac{2\,(bx+a)Ba^3d^4g}{dx+c}}{b^2d^2 - \frac{2\,(bx+a)bd^3}{dx+c} + \frac{(bx+a)^2d^4}{(dx+c)^2}} + \frac{\left(Bb^3c^3gn - 3\,Bab^2c^2dgn + 3\,Ba^2bcd^2gn - Ba^3d^3gn\right)\log\left(-b + \frac{(bx+a)d}{dx+c}\right)}{bd^2} - \frac{\left(Bb^3c^3gn - 3\,Bab^2c^2dgn + 3\,Ba^2bcd^2gn - Ba^3d^3gn\right)\log\left(\frac{bx+a}{dx+c}\right)}{bd^2}\right)\left(\frac{bc}{(bc-ad)^2} - \frac{ad}{(bc-ad)^2}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] 1/2*((B*b^4*c^3*g*n - 3*B*a*b^3*c^2*d*g*n - 2*(b*x + a)*B*b^3*c^3*d*g*n/(d*
x + c) + 3*B*a^2*b^2*c*d^2*g*n + 6*(b*x + a)*B*a*b^2*c^2*d^2*g*n/(d*x + c)
- B*a^3*b*d^3*g*n - 6*(b*x + a)*B*a^2*b*c*d^3*g*n/(d*x + c) + 2*(b*x + a)*B
*a^3*d^4*g*n/(d*x + c))*log((b*x + a)/(d*x + c))/(b^2*d^2 - 2*(b*x + a)*b*d
^3/(d*x + c) + (b*x + a)^2*d^4/(d*x + c)^2) + (B*b^4*c^3*g*n - 3*B*a*b^3*c^
2*d*g*n - (b*x + a)*B*b^3*c^3*d*g*n/(d*x + c) + 3*B*a^2*b^2*c*d^2*g*n + 3*(
b*x + a)*B*a*b^2*c^2*d^2*g*n/(d*x + c) - B*a^3*b*d^3*g*n - 3*(b*x + a)*B*a^
2*b*c*d^3*g*n/(d*x + c) + (b*x + a)*B*a^3*d^4*g*n/(d*x + c) + A*b^4*c^3*g +
 B*b^4*c^3*g - 3*A*a*b^3*c^2*d*g - 3*B*a*b^3*c^2*d*g - 2*(b*x + a)*A*b^3*c^
3*d*g/(d*x + c) - 2*(b*x + a)*B*b^3*c^3*d*g/(d*x + c) + 3*A*a^2*b^2*c*d^2*g
 + 3*B*a^2*b^2*c*d^2*g + 6*(b*x + a)*A*a*b^2*c^2*d^2*g/(d*x + c) + 6*(b*x +
 a)*B*a*b^2*c^2*d^2*g/(d*x + c) - A*a^3*b*d^3*g - B*a^3*b*d^3*g - 6*(b*x +
a)*A*a^2*b*c*d^3*g/(d*x + c) - 6*(b*x + a)*B*a^2*b*c*d^3*g/(d*x + c) + 2*(b
*x + a)*A*a^3*d^4*g/(d*x + c) + 2*(b*x + a)*B*a^3*d^4*g/(d*x + c))/(b^2*d^2
 - 2*(b*x + a)*b*d^3/(d*x + c) + (b*x + a)^2*d^4/(d*x + c)^2) + (B*b^3*c^3*
g*n - 3*B*a*b^2*c^2*d*g*n + 3*B*a^2*b*c*d^2*g*n - B*a^3*d^3*g*n)*log(-b + (
b*x + a)*d/(d*x + c))/(b*d^2) - (B*b^3*c^3*g*n - 3*B*a*b^2*c^2*d*g*n + 3*B*
a^2*b*c*d^2*g*n - B*a^3*d^3*g*n)*log((b*x + a)/(d*x + c))/(b*d^2))*(b*c/(b*
c - a*d)^2 - a*d/(b*c - a*d)^2)^2
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a\,g+b\,g\,x)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{(c\,i+d\,i\,x)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^2,
x)
```

```
[Out] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^2,
 x)
```

3.146 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=102

$$\frac{A(a+bx)}{(bc-ad)i^2(c+dx)}-\frac{Bn(a+bx)}{(bc-ad)i^2(c+dx)}+\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)i^2(c+dx)}$$

```
[Out] A*(b*x+a)/(-a*d+b*c)/i^2/(d*x+c)-B*n*(b*x+a)/(-a*d+b*c)/i^2/(d*x+c)+B*(b*x+
a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)/i^2/(d*x+c)
```

Rubi [A]
time = 0.03, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {2551, 2332}

$$\frac{A(a+bx)}{i^2(c+dx)(bc-ad)}+\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{i^2(c+dx)(bc-ad)}-\frac{Bn(a+bx)}{i^2(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x)^2,x]
```

```
[Out] (A*(a + b*x))/((b*c - a*d)*i^2*(c + d*x)) - (B*n*(a + b*x))/((b*c - a*d)*i^
2*(c + d*x)) + (B*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)*i^
2*(c + d*x))
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2551

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(m +
1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c -
 a*d, 0] && IntegersQ[m, p] && EqQ[d*f - c*g, 0] && (GtQ[p, 0] || LtQ[m, -1
])
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(146c+146dx)^2}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c+dx)} + \frac{(Bn)\int \frac{bc-ad}{146(a+bx)(c+dx)^2}\,dx}{146d}$$
$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c+dx)} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)^2}\,dx}{21316d}$$
$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c+dx)} + \frac{(B(bc-ad)n)\int \left(\frac{b^2}{(bc-ad)^2(a+bx)} - \frac{d}{(bc-ad)(c+dx)^2} - \cdots\right.}{21316d}$$
$$= \frac{Bn}{21316d(c+dx)} + \frac{bBn\log(a+bx)}{21316d(bc-ad)} - \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c+dx)} - \frac{bBn\log(c+\cdots}{21316d(bc-\cdots}$$

Mathematica [**A**]
time = 0.04, size = 114, normalized size = 1.12

$$-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{di(ci+dix)} + \frac{B(bc-ad)n\left(\frac{1}{(bc-ad)(c+dx)} + \frac{b\log(a+bx)}{(bc-ad)^2} - \frac{b\log(c+dx)}{(bc-ad)^2}\right)}{di^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x)^2,x]
```

```
[Out] -((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(d*i*(c*i + d*i*x))) + (B*(b*c - a
*d)*n*(1/((b*c - a*d)*(c + d*x)) + (b*Log[a + b*x])/(b*c - a*d)^2 - (b*Log[
c + d*x])/(b*c - a*d)^2))/(d*i^2)
```

Maple [**F**]
time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

Maxima [**A**]
time = 0.26, size = 112, normalized size = 1.10

$$-Bn\left(\frac{b\log(bx+a)}{bcd-ad^2} - \frac{b\log(dx+c)}{bcd-ad^2} + \frac{1}{d^2x+cd}\right) + \frac{B\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)}{d^2x+cd} + \frac{A}{d^2x+cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, algorithm="maxi
ma")
```

```
[Out] -B*n*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^2) + 1/(
d^2*x + c*d)) + B*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(d^2*x + c*d) + A/
(d^2*x + c*d)
```

Fricas [A]
time = 0.39, size = 87, normalized size = 0.85

$$\frac{(A+B)bc-(A+B)ad-(Bbc-Bad)n-(Bbdnx+Badn)\log\left(\frac{bx+a}{dx+c}\right)}{bc^2d-acd^2+(bcd^2-ad^3)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, algorithm="fric
as")
```

```
[Out] ((A + B)*b*c - (A + B)*a*d - (B*b*c - B*a*d)*n - (B*b*d*n*x + B*a*d*n)*log(
(b*x + a)/(d*x + c)))/(b*c^2*d - a*c*d^2 + (b*c*d^2 - a*d^3)*x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**2,x)
```

```
[Out] Exception raised: NotImplementedError >> no valid subset found
```

Giac [A]
time = 3.47, size = 84, normalized size = 0.82

$$-\left(\frac{(bx+a)Bn\log\left(\frac{bx+a}{dx+c}\right)}{dx+c}-\frac{(Bn-A-B)(bx+a)}{dx+c}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, algorithm="giac
")
```

```
[Out] -((b*x + a)*B*n*log((b*x + a)/(d*x + c))/(d*x + c) - (B*n - A - B)*(b*x + a
)/(d*x + c))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 4.84, size = 113, normalized size = 1.11

$$-\frac{A-B\,n}{x\,d^2\,i^2+c\,d\,i^2}-\frac{B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{d\,\left(c\,i^2+d\,i^2\,x\right)}+\frac{B\,b\,n\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,2\mathrm{i}}{d\,i^2\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(c*i + d*i*x)^2,x)
```

```
[Out] (B*b*n*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*2i)/(d*i^2*(a*d - b*c)) -
 (B*log(e*((a + b*x)/(c + d*x))^n))/(d*(c*i^2 + d*i^2*x)) - (A - B*n)/(d^2*
i^2*x + c*d*i^2)
```

3.147 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)^2}\,dx$

Optimal. Leaf size=166

$$-\frac{Ad(a+bx)}{(bc-ad)^2gi^2(c+dx)}+\frac{Bdn(a+bx)}{(bc-ad)^2gi^2(c+dx)}-\frac{Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)^2gi^2(c+dx)}+\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2B(bc-ad)^2gi^2n}$$

```
[Out] -A*d*(b*x+a)/(-a*d+b*c)^2/g/i^2/(d*x+c)+B*d*n*(b*x+a)/(-a*d+b*c)^2/g/i^2/(d
*x+c)-B*d*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)^2/g/i^2/(d*x+c)+1/2*
b*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/B/(-a*d+b*c)^2/g/i^2/n
```

Rubi [A]
time = 0.12, antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 2388, 2338, 2332}

$$\frac{b\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2Bgi^2n(bc-ad)^2}-\frac{Ad(a+bx)}{gi^2(c+dx)(bc-ad)^2}-\frac{Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{gi^2(c+dx)(bc-ad)^2}+\frac{Bdn(a+bx)}{gi^2(c+dx)(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*x)^2),
x]
```

```
[Out] -((A*d*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x))) + (B*d*n*(a + b*x))/((b*
c - a*d)^2*g*i^2*(c + d*x)) - (B*d*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n]
)/((b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2)/(2*B*(b*c - a*d)^2*g*i^2*n)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2388

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[(d + e*x)^(q - 1)*((a + b*Log[c*x^n])^p/x),
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(147c+147dx)^2(ag+bgx)}\,dx = \int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)^2g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)g(c+dx)^2} - \frac{bd(A+}{21609(b}\right.$$

$$= \frac{b^2\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{21609(bc-ad)^2g} - \frac{(bd)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{21609(bc-ad)^2g} - \frac{d\int\frac{A+B\log(e(}{(c+dx}}{21609(bc-}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)^2g} - \frac{b(}{}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)^2g} - \frac{b(}{}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)^2g} - \frac{b(}{}$$

$$= -\frac{Bn}{21609(bc-ad)g(c+dx)} - \frac{bBn\log(a+bx)}{21609(bc-ad)^2g} + \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.}{21609(bc-ad)g(c+}$$

$$= -\frac{Bn}{21609(bc-ad)g(c+dx)} - \frac{bBn\log(a+bx)}{21609(bc-ad)^2g} - \frac{bBn\log^2(a+bx)}{43218(bc-ad)^2g} +$$

$$= -\frac{Bn}{21609(bc-ad)g(c+dx)} - \frac{bBn\log(a+bx)}{21609(bc-ad)^2g} - \frac{bBn\log^2(a+bx)}{43218(bc-ad)^2g} +$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.21, size = 304, normalized size = 1.83

$$\frac{2(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2b(c+dx)\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-2b(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)-2Bn(bc-ad+b(c+dx)\log(a+bx)-b(c+dx)\log(c+dx))-bBn(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+bBn(c+dx)\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{2(bc-ad)^2gi^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*
x)^2),x]
```

```
[Out] (2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b*(c + d*x)*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*B*n*(b*c - a*d + b*(c + d*x)*Lo
g[a + b*x] - b*(c + d*x)*Log[c + d*x]) - b*B*n*(c + d*x)*(Log[a + b*x]*(Log
[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/
(-(b*c) + a*d)]) + b*B*n*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(2*(
b*c - a*d)^2*g*i^2*(c + d*x))
```

Maple [**F**]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{(bgx + ag)\,(dix + ci)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 385 vs. $2(153) = 306$.
time = 0.29, size = 385, normalized size = 2.32

$$-B\left(\frac{b\log(bx+a)}{(b^2c^2-2\,abcd+a^2d^2)g}-\frac{b\log(dx+c)}{(b^2c^2-2\,abcd+a^2d^2)g}+\frac{1}{(bcd-ad^2)gx+(bc^2-acd)g}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)+\frac{\left((bdx+bc)\log(bx+a)^2+(bdx+bc)\log(dx+c)^2+2\,bc-2\,ad+2\,(bdx+bc)\log(bx+a)-2\,(bdx+bc+(bdx+bc)\log(bx+a))\log(dx+c)\right)Bn}{2\,(b^2c^3g-2\,abc^2dg+a^2cd^2g+(b^2c^2dg-2\,abcd^2g+a^2d^3g)x)}-A\left(\frac{b\log(bx+a)}{(b^2c^2-2\,abcd+a^2d^2)g}-\frac{b\log(dx+c)}{(b^2c^2-2\,abcd+a^2d^2)g}+\frac{1}{(bcd-ad^2)gx+(bc^2-acd)g}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] -B*(b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) - b*log(d*x + c)/((b
^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) + 1/((b*c*d - a*d^2)*g*x + (b*c^2 - a*c*d)
*g))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/2*((b*d*x + b*c)*log(b*x +
a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log(b
*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*B*n/(b
^2*c^3*g - 2*a*b*c^2*d*g + a^2*c*d^2*g + (b^2*c^2*d*g - 2*a*b*c*d^2*g + a^2
*d^3*g)*x) - A*(b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) - b*log(
d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) + 1/((b*c*d - a*d^2)*g*x + (b*
c^2 - a*c*d)*g))
```

Fricas [**A**]
time = 0.39, size = 159, normalized size = 0.96

$$-\frac{2\,(A+B)bc-2\,(A+B)ad+(Bbdnx+Bbcn)\log\left(\frac{bx+a}{dx+c}\right)^{2}-2\,(Bbc-Bad)n-2\,(Badn-(A+B)bc+(Bbdn-(A+B)bd)x)\log\left(\frac{bx+a}{dx+c}\right)}{2\,((b^2c^2d-2\,abcd^2+a^2d^3)gx+(b^2c^3-2\,abc^2d+a^2cd^2)g)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] -1/2*(2*(A + B)*b*c - 2*(A + B)*a*d + (B*b*d*n*x + B*b*c*n)*log((b*x + a)/(
d*x + c))^2 - 2*(B*b*c - B*a*d)*n - 2*(B*a*d*n - (A + B)*b*c + (B*b*d*n - (
A + B)*b*d)*x)*log((b*x + a)/(d*x + c)))/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^
3)*g*x + (b^2*c^3 - 2*a*b*c^2*d + a^2*c*d^2)*g)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

$$\text{Timed out}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 4.07, size = 180, normalized size = 1.08

$$-\frac{1}{2}\left(\frac{Bbn\log\left(\frac{bx+a}{dx+c}\right)^2}{bcg-adg}-\frac{2\,(bx+a)Bdn\log\left(\frac{bx+a}{dx+c}\right)}{(bcg-adg)(dx+c)}+\frac{2\,(Ab+Bb)\log\left(\frac{bx+a}{dx+c}\right)}{bcg-adg}+\frac{2\,(Bdn-Ad-Bd)(bx+a)}{(bcg-adg)(dx+c)}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] -1/2*(B*b*n*log((b*x + a)/(d*x + c))^2/(b*c*g - a*d*g) - 2*(b*x + a)*B*d*n*
log((b*x + a)/(d*x + c))/((b*c*g - a*d*g)*(d*x + c)) + 2*(A*b + B*b)*log((b
*x + a)/(d*x + c))/(b*c*g - a*d*g) + 2*(B*d*n - A*d - B*d)*(b*x + a)/((b*c*
g - a*d*g)*(d*x + c)))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [**B**]
time = 4.82, size = 241, normalized size = 1.45

$$\frac{B\,n}{g\,i^2\,\left(a\,d-b\,c\right)\,\left(c+d\,x\right)}-\frac{A}{g\,i^2\,\left(a\,d-b\,c\right)\,\left(c+d\,x\right)}-\frac{B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{g\,i^2\,\left(a\,d-b\,c\right)\,\left(c+d\,x\right)}+\frac{B\,b\,{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}^2}{2\,g\,i^2\,n\,{\left(a\,d-b\,c\right)}^2}-\frac{A\,b\,\mathrm{atan}\left(\frac{a\,d\,1{}\mathrm{i}+b\,c\,1{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}\right)\,2{}\mathrm{i}}{g\,i^2\,{\left(a\,d-b\,c\right)}^2}+\frac{B\,b\,n\,\mathrm{atan}\left(\frac{a\,d\,1{}\mathrm{i}+b\,c\,1{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}\right)\,2{}\mathrm{i}}{g\,i^2\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)*(c*i + d*i*x)^2),
x)
```

```
[Out] (B*n)/(g*i^2*(a*d - b*c)*(c + d*x)) - A/(g*i^2*(a*d - b*c)*(c + d*x)) - (B*
log(e*((a + b*x)/(c + d*x))^n))/(g*i^2*(a*d - b*c)*(c + d*x)) - (A*b*atan((
a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(g*i^2*(a*d - b*c)^2) + (B*b*n
*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(g*i^2*(a*d - b*c)^2) +
 (B*b*log(e*((a + b*x)/(c + d*x))^n)^2)/(2*g*i^2*n*(a*d - b*c)^2)
```

3.148 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)^2}\,dx$

Optimal. Leaf size=273

$$-\frac{Bd^2n(a+bx)}{(bc-ad)^3g^2i^2(c+dx)}-\frac{b^2Bn(c+dx)}{(bc-ad)^3g^2i^2(a+bx)}+\frac{d^2(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^3g^2i^2(c+dx)}-\frac{b^2(c+dx)\left(A+B\log\right.}{(bc-ad)^3g^2i^2}$$

```
[Out] -B*d^2*n*(b*x+a)/(-a*d+b*c)^3/g^2/i^2/(d*x+c)-b^2*B*n*(d*x+c)/(-a*d+b*c)^3/
g^2/i^2/(b*x+a)+d^2*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^
2/i^2/(d*x+c)-b^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^2/
i^2/(b*x+a)-2*b*d*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/(-a*d
+b*c)^3/g^2/i^2+b*B*d*n*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^3/g^2/i^2
```

Rubi [A]

time = 0.15, antiderivative size = 273, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 45, 2372, 2338}

$$-\frac{b^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(a+bx)(bc-ad)^3}+\frac{d^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(c+dx)(bc-ad)^3}-\frac{2bd\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(bc-ad)^3}-\frac{b^2Bn(c+dx)}{g^2i^2(a+bx)(bc-ad)^3}-\frac{Bd^2n(a+bx)}{g^2i^2(c+dx)(bc-ad)^3}+\frac{bBdn\log^2\left(\frac{a+bx}{c+dx}\right)}{g^2i^2(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*i*x)^2
),x]
```

```
[Out] -((B*d^2*n*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x))) - (b^2*B*n*(c + d*
x))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) + (d^2*(a + b*x)*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (b^2*(c + d*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*
b*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c
- a*d)^3*g^2*i^2) + (b*B*d*n*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^3*g^2
*i^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(148c+148dx)^2(ag+bgx)^2}\,dx = \int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(a+bx)^2} - \frac{b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{10952(bc-ad)^3g^2(a+bx)} + \frac{d^2(\ldots}{219\ldots}\right.$$

$$= -\frac{(b^2d)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{10952(bc-ad)^3g^2} + \frac{(bd^2)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{10952(bc-ad)^3g^2} + \frac{b^2\int\frac{A+\ldots}{\ldots}}{219\ldots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a\ldots}{\ldots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a\ldots}{\ldots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a\ldots}{\ldots}$$

$$= -\frac{bBn}{21904(bc-ad)^2g^2(a+bx)} + \frac{Bdn}{21904(bc-ad)^2g^2(c+dx)} - \frac{b(A+\ldots}{21904(b\ldots}$$

$$= -\frac{bBn}{21904(bc-ad)^2g^2(a+bx)} + \frac{Bdn}{21904(bc-ad)^2g^2(c+dx)} + \frac{bBdn\,\mathrm{lo}\ldots}{21904(b\ldots}$$

$$= -\frac{bBn}{21904(bc-ad)^2g^2(a+bx)} + \frac{Bdn}{21904(bc-ad)^2g^2(c+dx)} + \frac{bBdn\,\mathrm{lo}\ldots}{21904(b\ldots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.30, size = 342, normalized size = 1.25

$$\frac{-\frac{b^2Bcn}{a+bx}+\frac{abBdn}{a+bx}+\frac{bBcdn}{c+dx}-\frac{aBd^2n}{c+dx}-\frac{b(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx}+\frac{d(-bc+ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{c+dx}-2bd\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)+bBdn\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)-bBdn\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{(bc-ad)^3g^2i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*
i*x)^2),x]
```

```
[Out] (-((b^2*B*c*n)/(a + b*x)) + (a*b*B*d*n)/(a + b*x) + (b*B*c*d*n)/(c + d*x) -
 (a*B*d^2*n)/(c + d*x) - (b*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]))/(a + b*x) + (d*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(c + d*x) - 2*b*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b
*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + b*B*d*n*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) - b*B*d*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*
c - a*d)^3*g^2*i^2)
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{\left(bgx+ag\right)^{2}\left(dix+ci\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 794 vs. $2(257) = 514$.
time = 0.32, size = 794, normalized size = 2.91

$$B\left(\frac{2\,bdx+bc+ad}{(b^3c^2d-2\,ab^2cd^2+a^2bd^3)g^2x^2+(b^3c^3-ab^2c^2d-a^2bcd^2+a^3d^3)g^2x+(ab^2c^3-2\,a^2bc^2d+a^3cd^2)g^2}+\frac{2\,bd\log(bx+a)}{(b^3c^3-3\,ab^2c^2d+3\,a^2bcd^2-a^3d^3)g^2}-\frac{2\,bd\log(dx+c)}{(b^3c^3-3\,ab^2c^2d+3\,a^2bcd^2-a^3d^3)g^2}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)+\frac{(b^2c^2-2\,abcd+a^2d^2-(b^2d^2x^2+abcd+(b^2cd+abd^2)x)\log(bx+a)^2+2\,(b^2d^2x^2+abcd+(b^2cd+abd^2)x)\log(bx+a)\log(dx+c)-(b^2d^2x^2+abcd+(b^2cd+abd^2)x)\log(dx+c)^2)Bn}{ab^3c^4g^2-3\,a^2b^2c^3dg^2+3\,a^3bc^2d^2g^2-a^4cd^3g^2+(b^4c^3dg^2-3\,ab^3c^2d^2g^2+3\,a^2b^2cd^3g^2-a^3bd^4g^2)x^2+(b^4c^4g^2-2\,ab^3c^3dg^2+2\,a^3bcd^3g^2-a^4d^4g^2)x}+A\left(\frac{2\,bdx+bc+ad}{(b^3c^2d-2\,ab^2cd^2+a^2bd^3)g^2x^2+(b^3c^3-ab^2c^2d-a^2bcd^2+a^3d^3)g^2x+(ab^2c^3-2\,a^2bc^2d+a^3cd^2)g^2}+\frac{2\,bd\log(bx+a)}{(b^3c^3-3\,ab^2c^2d+3\,a^2bcd^2-a^3d^3)g^2}-\frac{2\,bd\log(dx+c)}{(b^3c^3-3\,ab^2c^2d+3\,a^2bcd^2-a^3d^3)g^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*x^2 +
 (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*x + (a*b^2*c^3 - 2*a^2
*b*c^2*d + a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d +
 3*a^2*b*c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2))*log((b*x/(d*x + c) + a/(d*x + c))^n*e)
+ (b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*
```

```
d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*
log(b*x + a)*log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)
*log(d*x + c)^2)*B*n/(a*b^3*c^4*g^2 - 3*a^2*b^2*c^3*d*g^2 + 3*a^3*b*c^2*d^2
*g^2 - a^4*c*d^3*g^2 + (b^4*c^3*d*g^2 - 3*a*b^3*c^2*d^2*g^2 + 3*a^2*b^2*c*d
^3*g^2 - a^3*b*d^4*g^2)*x^2 + (b^4*c^4*g^2 - 2*a*b^3*c^3*d*g^2 + 2*a^3*b*c*
d^3*g^2 - a^4*d^4*g^2)*x) + A*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*
c*d^2 + a^2*b*d^3)*g^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3
)*g^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)
/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x
+ c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2))
```

Fricas [A]
time = 0.39, size = 365, normalized size = 1.34

$$\frac{(A+B)b^2c^2-(A+B)a^2d^2+(Bb^2d^2nx^2+Babcdn+(Bb^2cd+Babd^2)nx)\log\left(\frac{bx+a}{dx+c}\right)^2+(Bb^2c^2-2\,Babcd+Ba^2d^2)n+2\,((A+B)b^2cd-(A+B)abd^2)x+(2\,(A+B)b^2d^2x^2+2\,(A+B)abcd+(Bb^2c^2-Ba^2d^2)n+2\,((A+B)b^2cd+(A+B)abd^2+(Bb^2cd-Babd^2)n)x)\log\left(\frac{bx+a}{dx+c}\right)}{(b^4c^3d-3\,ab^3c^2d^2+3\,a^2b^2cd^3-a^3bd^4)g^2x^2+(b^4c^4-2\,ab^3c^3d+2\,a^3bcd^3-a^4d^4)g^2x+(ab^3c^4-3\,a^2b^2c^3d+3\,a^3bc^2d^2-a^4cd^3)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] ((A + B)*b^2*c^2 - (A + B)*a^2*d^2 + (B*b^2*d^2*n*x^2 + B*a*b*c*d*n + (B*b^
2*c*d + B*a*b*d^2)*n*x)*log((b*x + a)/(d*x + c))^2 + (B*b^2*c^2 - 2*B*a*b*c
*d + B*a^2*d^2)*n + 2*((A + B)*b^2*c*d - (A + B)*a*b*d^2)*x + (2*(A + B)*b^
2*d^2*x^2 + 2*(A + B)*a*b*c*d + (B*b^2*c^2 - B*a^2*d^2)*n + 2*((A + B)*b^2*
c*d + (A + B)*a*b*d^2 + (B*b^2*c*d - B*a*b*d^2)*n)*x)*log((b*x + a)/(d*x +
c)))/((b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^2*x^2 +
 (b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 - a^4*d^4)*g^2*x + (a*b^3*c^4 - 3
*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3)*g^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 95.65, size = 86, normalized size = 0.32

$$\left(\frac{(dx+c)Bn\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)g^2}+\frac{(Bn+A+B)(dx+c)}{(bx+a)g^2}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] ((d*x + c)*B*n*log((b*x + a)/(d*x + c))/((b*x + a)*g^2) + (B*n + A + B)*(d*
x + c)/((b*x + a)*g^2))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)^2
```

Mupad [B]
time = 5.46, size = 432, normalized size = 1.58

$$\frac{B\,b\,d\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)^2}{g^2\,i^2\,n\,{\left(a\,d-b\,c\right)}^3}-\frac{A\,b\,c}{g^2\,i^2\,{\left(a\,d-b\,c\right)}^2\,\left(a+b\,x\right)\,\left(c+d\,x\right)}-\frac{A\,a\,d}{g^2\,i^2\,{\left(a\,d-b\,c\right)}^2\,\left(a+b\,x\right)\,\left(c+d\,x\right)}+\frac{B\,a\,d\,n}{g^2\,i^2\,{\left(a\,d-b\,c\right)}^2\,\left(a+b\,x\right)\,\left(c+d\,x\right)}-\frac{B\,b\,c\,n}{g^2\,i^2\,{\left(a\,d-b\,c\right)}^2\,\left(a+b\,x\right)\,\left(c+d\,x\right)}-\frac{2\,A\,b\,d\,x}{g^2\,i^2\,{\left(a\,d-b\,c\right)}^2\,\left(a+b\,x\right)\,\left(c+d\,x\right)}-\frac{B\,a\,d\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{g^2\,i^2\,{\left(a\,d-b\,c\right)}^2\,\left(a+b\,x\right)\,\left(c+d\,x\right)}-\frac{B\,b\,c\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{g^2\,i^2\,{\left(a\,d-b\,c\right)}^2\,\left(a+b\,x\right)\,\left(c+d\,x\right)}-\frac{2\,B\,b\,d\,x\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{g^2\,i^2\,{\left(a\,d-b\,c\right)}^2\,\left(a+b\,x\right)\,\left(c+d\,x\right)}-\frac{A\,b\,d\,\mathrm{atan}\left(\frac{a\,d\,1{}\mathrm{i}+b\,c\,1{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}\right)\,4{}\mathrm{i}}{g^2\,i^2\,{\left(a\,d-b\,c\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)^2*(c*i + d*i*x)^2
),x)
```

```
[Out] (B*b*d*log(e*((a + b*x)/(c + d*x))^n)^2)/(g^2*i^2*n*(a*d - b*c)^3) - (A*a*d
)/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) - (A*b*c)/(g^2*i^2*(a*d - b*c
)^2*(a + b*x)*(c + d*x)) - (A*b*d*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d -
b*c))*4i)/(g^2*i^2*(a*d - b*c)^3) + (B*a*d*n)/(g^2*i^2*(a*d - b*c)^2*(a + b
*x)*(c + d*x)) - (B*b*c*n)/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) - (2
*A*b*d*x)/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) - (B*a*d*log(e*((a +
b*x)/(c + d*x))^n))/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) - (B*b*c*lo
g(e*((a + b*x)/(c + d*x))^n))/(g^2*i^2*(a*d - b*c)^2*(a + b*x)*(c + d*x)) -
 (2*B*b*d*x*log(e*((a + b*x)/(c + d*x))^n))/(g^2*i^2*(a*d - b*c)^2*(a + b*x
)*(c + d*x))
```

3.149 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)^2}\,dx$

Optimal. Leaf size=380

$$\frac{Bd^3n(a+bx)}{(bc-ad)^4g^3i^2(c+dx)}+\frac{3b^2Bdn(c+dx)}{(bc-ad)^4g^3i^2(a+bx)}-\frac{b^3Bn(c+dx)^2}{4(bc-ad)^4g^3i^2(a+bx)^2}-\frac{d^3(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^4g^3i^2(c+dx)}$$

```
[Out] B*d^3*n*(b*x+a)/(-a*d+b*c)^4/g^3/i^2/(d*x+c)+3*b^2*B*d*n*(d*x+c)/(-a*d+b*c)
^4/g^3/i^2/(b*x+a)-1/4*b^3*B*n*(d*x+c)^2/(-a*d+b*c)^4/g^3/i^2/(b*x+a)^2-d^3
*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^3/i^2/(d*x+c)+3*b^2
*d*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^3/i^2/(b*x+a)-1/2
*b^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^3/i^2/(b*x+a)
^2+3*b*d^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/(-a*d+b*c)^4
/g^3/i^2-3/2*b*B*d^2*n*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^4/g^3/i^2
```

Rubi [A]
time = 0.20, antiderivative size = 380, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.140$, Rules used = {2561, 45, 2372, 12, 14, 2338}

$$-\frac{b^3(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2d(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^2(a+bx)(bc-ad)^4}-\frac{d^3(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^2(c+dx)(bc-ad)^4}+\frac{3bd^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^2(bc-ad)^4}-\frac{b^3Bn(c+dx)^2}{4g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2Bdn(c+dx)}{g^3i^2(a+bx)(bc-ad)^4}+\frac{Bd^3n(a+bx)}{g^3i^2(c+dx)(bc-ad)^4}-\frac{3bBd^2n\log^2\left(\frac{a+bx}{c+dx}\right)}{2g^3i^2(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*i*x)^2
),x]
```

```
[Out] (B*d^3*n*(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*B*d*n*(c + d
*x))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B*n*(c + d*x)^2)/(4*(b*c - a*
d)^4*g^3*i^2*(a + b*x)^2) - (d^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*d*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*(c + d
*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^3*i^2*(a +
 b*x)^2) + (3*b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c
 + d*x)])/((b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*n*Log[(a + b*x)/(c + d*x)]^2
)/(2*(b*c - a*d)^4*g^3*i^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(149c+149dx)^2(ag+bgx)^3}\,dx = \int\left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^2g^3(a+bx)^3} - \frac{2b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2 \cdots}{2\cdots}\right.$$

$$= \frac{(3b^2d^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{22201(bc-ad)^4g^3} - \frac{(3bd^3)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{22201(bc-ad)^4g^3} - \frac{(2b^2d \cdots}{\cdots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{44402(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^3g^3(a+bx)} + \frac{d^2(A \cdots}{22201 \cdots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{44402(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^3g^3(a+bx)} + \frac{d^2(A \cdots}{22201 \cdots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{44402(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^3g^3(a+bx)} + \frac{d^2(A \cdots}{22201 \cdots}$$

$$= -\frac{bBn}{88804(bc-ad)^2g^3(a+bx)^2} + \frac{5bBdn}{44402(bc-ad)^3g^3(a+bx)} - \frac{\cdots}{22201 \cdots}$$

$$= -\frac{bBn}{88804(bc-ad)^2g^3(a+bx)^2} + \frac{5bBdn}{44402(bc-ad)^3g^3(a+bx)} - \frac{\cdots}{22201 \cdots}$$

$$= -\frac{bBn}{88804(bc-ad)^2g^3(a+bx)^2} + \frac{5bBdn}{44402(bc-ad)^3g^3(a+bx)} - \frac{\cdots}{22201 \cdots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.49, size = 478, normalized size = 1.26

$$\frac{-\frac{bB(bc-ad)^2n}{(a+bx)^2} + \frac{8b^2Bcdn}{a+bx} - \frac{8abBd^2n}{a+bx} + \frac{2bBd(bc-ad)n}{a+bx} - \frac{4bBcd^2n}{c+dx} + \frac{4aBd^3n}{c+dx} + 6bBd^2n\log(a+bx) - \frac{2b(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)^2} + \frac{8bd(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx} + \frac{4d^2(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{c+dx} + 12bd^2\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) - 6bBd^2n\log(c+dx) - 12bd^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx) - 6bBd^2n\left(\log(a+bx)\left(\log(a+bx) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right) + 6bBd^2n\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right) - \log(c+dx)\right)\log(c+dx) + 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^4g^3i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*
i*x)^2),x]
```

```
[Out] (-((b*B*(b*c - a*d)^2*n)/(a + b*x)^2) + (8*b^2*B*c*d*n)/(a + b*x) - (8*a*b*
B*d^2*n)/(a + b*x) + (2*b*B*d*(b*c - a*d)*n)/(a + b*x) - (4*b*B*c*d^2*n)/(c
 + d*x) + (4*a*B*d^3*n)/(c + d*x) + 6*b*B*d^2*n*Log[a + b*x] - (2*b*(b*c -
a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (8*b*d*(b*c -
a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + (4*d^2*(b*c - a*d)
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) + 12*b*d^2*Log[a + b*x]*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*b*B*d^2*n*Log[c + d*x] - 12*b*d^
```

```
2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 6*b*B*d^2*n*(Log[a
+ b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)]) + 6*b*B*d^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
))/(4*(b*c - a*d)^4*g^3*i^2)
```

Maple [F]
time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{\left(bgx+ag\right)^{3}\left(dix+ci\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1623 vs. $2(354) = 708$.
time = 0.42, size = 1623, normalized size = 4.27

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] -1/2*B*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a
*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g
^3*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a
^4*b*d^4)*g^3*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^
4*b*c*d^3 - a^5*d^4)*g^3*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d
^2 - a^5*c*d^3)*g^3) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a
^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3) - 6*b*d^2*log(d*x + c)/((b^4
*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3))*l
og((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/4*(b^3*c^3 - 12*a*b^2*c^2*d + 15*
a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3 +
a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x
)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)
*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(3*b^3*c^2*d - 2*a
*b^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a
*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(b^3*d^3*x^
3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^
3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*
b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*B*n/(a^2*b^4*c^5*g^3
```

```
- 4*a^3*b^3*c^4*d*g^3 + 6*a^4*b^2*c^3*d^2*g^3 - 4*a^5*b*c^2*d^3*g^3 + a^6*c
*d^4*g^3 + (b^6*c^4*d*g^3 - 4*a*b^5*c^3*d^2*g^3 + 6*a^2*b^4*c^2*d^3*g^3 - 4
*a^3*b^3*c*d^4*g^3 + a^4*b^2*d^5*g^3)*x^3 + (b^6*c^5*g^3 - 2*a*b^5*c^4*d*g^
3 - 2*a^2*b^4*c^3*d^2*g^3 + 8*a^3*b^3*c^2*d^3*g^3 - 7*a^4*b^2*c*d^4*g^3 + 2
*a^5*b*d^5*g^3)*x^2 + (2*a*b^5*c^5*g^3 - 7*a^2*b^4*c^4*d*g^3 + 8*a^3*b^3*c^
3*d^2*g^3 - 2*a^4*b^2*c^2*d^3*g^3 - 2*a^5*b*c*d^4*g^3 + a^6*d^5*g^3)*x) - 1
/2*A*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b
*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3
*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4
*b*d^4)*g^3*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*
b*c*d^3 - a^5*d^4)*g^3*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2
 - a^5*c*d^3)*g^3) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2
*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3) - 6*b*d^2*log(d*x + c)/((b^4*c
^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3))
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 776 vs. $2(354) = 708$.
time = 0.41, size = 776, normalized size = 2.04

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] 1/4*(2*(A + B)*b^3*c^3 - 12*(A + B)*a*b^2*c^2*d + 6*(A + B)*a^2*b*c*d^2 + 4
*(A + B)*a^3*d^3 - 6*(2*(A + B)*b^3*c*d^2 - 2*(A + B)*a*b^2*d^3 + (B*b^3*c*
d^2 - B*a*b^2*d^3)*n)*x^2 - 6*(B*b^3*d^3*n*x^3 + B*a^2*b*c*d^2*n + (B*b^3*c
*d^2 + 2*B*a*b^2*d^3)*n*x^2 + (2*B*a*b^2*c*d^2 + B*a^2*b*d^3)*n*x)*log((b*x
 + a)/(d*x + c))^2 + (B*b^3*c^3 - 12*B*a*b^2*c^2*d + 15*B*a^2*b*c*d^2 - 4*B
*a^3*d^3)*n - 3*(2*(A + B)*b^3*c^2*d + 4*(A + B)*a*b^2*c*d^2 - 6*(A + B)*a^
2*b*d^3 + (3*B*b^3*c^2*d - 2*B*a*b^2*c*d^2 - B*a^2*b*d^3)*n)*x - 2*(6*(A +
B)*a^2*b*c*d^2 + 3*(B*b^3*d^3*n + 2*(A + B)*b^3*d^3)*x^3 + 3*(3*B*b^3*c*d^2
*n + 2*(A + B)*b^3*c*d^2 + 4*(A + B)*a*b^2*d^3)*x^2 - (B*b^3*c^3 - 6*B*a*b^
2*c^2*d + 2*B*a^3*d^3)*n + 3*(4*(A + B)*a*b^2*c*d^2 + 2*(A + B)*a^2*b*d^3 +
 (B*b^3*c^2*d + 4*B*a*b^2*c*d^2 - 2*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x +
 c)))/((b^6*c^4*d - 4*a*b^5*c^3*d^2 + 6*a^2*b^4*c^2*d^3 - 4*a^3*b^3*c*d^4 +
 a^4*b^2*d^5)*g^3*x^3 + (b^6*c^5 - 2*a*b^5*c^4*d - 2*a^2*b^4*c^3*d^2 + 8*a^
3*b^3*c^2*d^3 - 7*a^4*b^2*c*d^4 + 2*a^5*b*d^5)*g^3*x^2 + (2*a*b^5*c^5 - 7*a
^2*b^4*c^4*d + 8*a^3*b^3*c^3*d^2 - 2*a^4*b^2*c^2*d^3 - 2*a^5*b*c*d^4 + a^6*
d^5)*g^3*x + (a^2*b^4*c^5 - 4*a^3*b^3*c^4*d + 6*a^4*b^2*c^3*d^2 - 4*a^5*b*c
^2*d^3 + a^6*c*d^4)*g^3)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 124.71, size = 222, normalized size = 0.58

$$\frac{1}{4}\left(\frac{2\left(Bbn-\frac{2(bx+a)Bdn}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^2bcg^3}{(dx+c)^2}-\frac{(bx+a)^2adg^3}{(dx+c)^2}}+\frac{Bbn-\frac{4(bx+a)Bdn}{dx+c}+2\,Ab+2\,Bb-\frac{4(bx+a)Ad}{dx+c}-\frac{4(bx+a)Bd}{dx+c}}{\frac{(bx+a)^2bcg^3}{(dx+c)^2}-\frac{(bx+a)^2adg^3}{(dx+c)^2}}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] 1/4*(2*(B*b*n - 2*(b*x + a)*B*d*n/(d*x + c))*log((b*x + a)/(d*x + c))/((b*x
 + a)^2*b*c*g^3/(d*x + c)^2 - (b*x + a)^2*a*d*g^3/(d*x + c)^2) + (B*b*n - 4
*(b*x + a)*B*d*n/(d*x + c) + 2*A*b + 2*B*b - 4*(b*x + a)*A*d/(d*x + c) - 4*
(b*x + a)*B*d/(d*x + c))/((b*x + a)^2*b*c*g^3/(d*x + c)^2 - (b*x + a)^2*a*d
*g^3/(d*x + c)^2))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)^2
```

Mupad [B]
time = 7.38, size = 1016, normalized size = 2.67

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)^3*(c*i + d*i*x)^2
),x)
```

```
[Out] (3*B*b*d^2*log(e*((a + b*x)/(c + d*x))^n)^2)/(2*g^3*i^2*n*(a*d - b*c)^4) -
((4*A*a^2*d^2 - 2*A*b^2*c^2 - 4*B*a^2*d^2*n - B*b^2*c^2*n + 10*A*a*b*c*d +
11*B*a*b*c*d*n)/(2*(a*d - b*c)) + (3*x^2*(2*A*b^2*d^2 + B*b^2*d^2*n))/(a*d
- b*c) + (3*x*(6*A*a*b*d^2 + 2*A*b^2*c*d + B*a*b*d^2*n + 3*B*b^2*c*d*n))/(2
*(a*d - b*c)))/(x*(2*a^4*d^3*g^3*i^2 + 4*a*b^3*c^3*g^3*i^2 - 6*a^2*b^2*c^2*
d*g^3*i^2) + x^2*(2*b^4*c^3*g^3*i^2 + 4*a^3*b*d^3*g^3*i^2 - 6*a^2*b^2*c*d^2
*g^3*i^2) + x^3*(2*a^2*b^2*d^3*g^3*i^2 + 2*b^4*c^2*d*g^3*i^2 - 4*a*b^3*c*d^
2*g^3*i^2) + 2*a^2*b^2*c^3*g^3*i^2 + 2*a^4*c*d^2*g^3*i^2 - 4*a^3*b*c^2*d*g^
3*i^2) - (b*d^2*atan((b*d^2*(2*A + B*n)*((a^4*d^4*g^3*i^2 - b^4*c^4*g^3*i^2
 + 2*a*b^3*c^3*d*g^3*i^2 - 2*a^3*b*c*d^3*g^3*i^2)/(a^3*d^3*g^3*i^2 - b^3*c^
3*g^3*i^2 + 3*a*b^2*c^2*d*g^3*i^2 - 3*a^2*b*c*d^2*g^3*i^2) + 2*b*d*x)*(a^3*
d^3*g^3*i^2 - b^3*c^3*g^3*i^2 + 3*a*b^2*c^2*d*g^3*i^2 - 3*a^2*b*c*d^2*g^3*i
^2)*3i)/(g^3*i^2*(6*A*b*d^2 + 3*B*b*d^2*n)*(a*d - b*c)^4))*(2*A + B*n)*3i)/
(g^3*i^2*(a*d - b*c)^4) - log(e*((a + b*x)/(c + d*x))^n)*(((B*(2*a*d + b*c)
)/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (3*B*b*d*x)/(2*(a^2*d^2 + b^2*c^2 -
```

```
 2*a*b*c*d)))/(x*(a^2*d*g^3*i^2 + 2*a*b*c*g^3*i^2) + x^2*(b^2*c*g^3*i^2 + 2
*a*b*d*g^3*i^2) + a^2*c*g^3*i^2 + b^2*d*g^3*i^2*x^3) + (3*B*b*d^2*(b*g^3*i^
2*n*x^2*(a*d - b*c) + (a*c*g^3*i^2*n*(a*d - b*c))/d + (g^3*i^2*n*x*(a*d + b
*c)*(a*d - b*c))/d))/(g^3*i^2*n*(a*d - b*c)^4*(x*(a^2*d*g^3*i^2 + 2*a*b*c*g
^3*i^2) + x^2*(b^2*c*g^3*i^2 + 2*a*b*d*g^3*i^2) + a^2*c*g^3*i^2 + b^2*d*g^3
*i^2*x^3)))
```

3.150 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)^2}\,dx$

Optimal. Leaf size=477

$$-\frac{Bd^4n(a+bx)}{(bc-ad)^5g^4i^2(c+dx)}-\frac{6b^2Bd^2n(c+dx)}{(bc-ad)^5g^4i^2(a+bx)}+\frac{b^3Bdn(c+dx)^2}{(bc-ad)^5g^4i^2(a+bx)^2}-\frac{b^4Bn(c+dx)^3}{9(bc-ad)^5g^4i^2(a+bx)^3}+\frac{d^4(a}{}$$

```
[Out] -B*d^4*n*(b*x+a)/(-a*d+b*c)^5/g^4/i^2/(d*x+c)-6*b^2*B*d^2*n*(d*x+c)/(-a*d+b
*c)^5/g^4/i^2/(b*x+a)+b^3*B*d*n*(d*x+c)^2/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^2-1/
9*b^4*B*n*(d*x+c)^3/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^3+d^4*(b*x+a)*(A+B*ln(e*((
b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^4/i^2/(d*x+c)-6*b^2*d^2*(d*x+c)*(A+B*ln(
e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^4/i^2/(b*x+a)+2*b^3*d*(d*x+c)^2*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^2-1/3*b^4*(d*x+c)^
3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^3-4*b*d^3*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/(-a*d+b*c)^5/g^4/i^2+2*b*
B*d^3*n*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^5/g^4/i^2
```

Rubi [A]
time = 0.20, antiderivative size = 477, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 45, 2372, 2338}

$$-\frac{b^4(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4i^2(a+bx)^3(bc-ad)^5}+\frac{2b^3d(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(a+bx)^2(bc-ad)^5}-\frac{6b^2d^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5}+\frac{d^4(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(c+dx)(bc-ad)^5}-\frac{4bd^3\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(bc-ad)^5}-\frac{b^4Bn(c+dx)^3}{9g^4i^2(a+bx)^3(bc-ad)^5}+\frac{b^3Bdn(c+dx)^2}{g^4i^2(a+bx)^2(bc-ad)^5}-\frac{6b^2Bd^2n(c+dx)}{g^4i^2(a+bx)(bc-ad)^5}-\frac{Bd^4n(a+bx)}{g^4i^2(c+dx)(bc-ad)^5}+\frac{2bBd^3n\log^2\left(\frac{a+bx}{c+dx}\right)}{g^4i^2(bc-ad)^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*i*x)^2
),x]
```

```
[Out] -((B*d^4*n*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x))) - (6*b^2*B*d^2*n*(
c + d*x))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (b^3*B*d*n*(c + d*x)^2)/((b*c
 - a*d)^5*g^4*i^2*(a + b*x)^2) - (b^4*B*n*(c + d*x)^3)/(9*(b*c - a*d)^5*g^4
*i^2*(a + b*x)^3) + (d^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (6*b^2*d^2*(c + d*x)*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*d*(c + d*x
)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^2*(a + b*x
)^2) - (b^4*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a
*d)^5*g^4*i^2*(a + b*x)^3) - (4*b*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^5*g^4*i^2) + (2*b*B*d^3*n*Log[(a +
 b*x)/(c + d*x)]^2)/((b*c - a*d)^5*g^4*i^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(150c+150dx)^2(ag+bgx)^4}\,dx = \int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc-ad)^2g^4(a+bx)^4} - \frac{b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11250(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d^2}{750\ldots}\right.$$

$$= -\frac{(b^2d^3)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{5625(bc-ad)^5g^4} + \frac{(bd^4)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{5625(bc-ad)^5g^4} + \frac{(b^2d^2)\int\ldots}{75\ldots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{67500(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2(A\ldots}{7500(b\ldots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{67500(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2(A\ldots}{7500(b\ldots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{67500(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2(A\ldots}{7500(b\ldots}$$

$$= -\frac{bBn}{202500(bc-ad)^2g^4(a+bx)^3} + \frac{bBdn}{33750(bc-ad)^3g^4(a+bx)^2} - \frac{\ldots}{67500\ldots}$$

$$= -\frac{bBn}{202500(bc-ad)^2g^4(a+bx)^3} + \frac{bBdn}{33750(bc-ad)^3g^4(a+bx)^2} - \frac{\ldots}{67500\ldots}$$

$$= -\frac{bBn}{202500(bc-ad)^2g^4(a+bx)^3} + \frac{bBdn}{33750(bc-ad)^3g^4(a+bx)^2} - \frac{\ldots}{67500\ldots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.90, size = 549, normalized size = 1.15

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*
i*x)^2),x]
```

```
[Out] -1/9*((b*B*(b*c - a*d)^3*n)/(a + b*x)^3 - (6*b*B*d*(b*c - a*d)^2*n)/(a + b*
x)^2 + (27*b^2*B*c*d^2*n)/(a + b*x) - (27*a*b*B*d^3*n)/(a + b*x) + (12*b*B*
d^2*(b*c - a*d)*n)/(a + b*x) - (9*b*B*c*d^3*n)/(c + d*x) + (9*a*B*d^4*n)/(c
 + d*x) + 30*b*B*d^3*n*Log[a + b*x] + (3*b*(b*c - a*d)^3*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(a + b*x)^3 - (9*b*d*(b*c - a*d)^2*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(a + b*x)^2 + (27*b*d^2*(b*c - a*d)*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(a + b*x) - (9*d^3*(-(b*c) + a*d)*(A + B*Log[e*((a +
```

```
 b*x)/(c + d*x))^n]))/(c + d*x) + 36*b*d^3*Log[a + b*x]*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]) - 30*b*B*d^3*n*Log[c + d*x] - 36*b*d^3*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])*Log[c + d*x] - 18*b*B*d^3*n*(Log[a + b*x]*(Log[a + b
*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c
) + a*d)]) + 18*b*B*d^3*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d
*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^
5*g^4*i^2)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{\left(bgx+ag\right)^{4}\left(dix+ci\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 2426 vs. 2(449) = 898.
time = 0.52, size = 2426, normalized size = 5.09

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] 1/3*B*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d
^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^
2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c
*d^4 + a^4*b^3*d^5)*g^4*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 +
14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*x^3 + 3*(a*b^6*c
^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*
d^4 + a^6*b*d^5)*g^4*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c
^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*x + (a^3*b^4*c^5 -
4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4) + 1
2*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^
3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4) - 12*b*d^3*log(d*x + c)/((b^5
*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*
d^4 - a^5*d^5)*g^4))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/9*(b^4*c^4
- 9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*a^3*b*c*d^3 + 9*a^4*d^4 + 30*(b^4
*c*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^2 + 8*a*b^3*c*d^3 - 19*a^2*b^2*d^
4)*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*
```

```
(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x
+ a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*
(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(d*x
+ c)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 + 57*a^2*b^2*c*d^3 + 19*a^3*b*d^4)
*x + 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b
^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)
 - 6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*
(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^
4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 +
a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a))*log(d*x +
 c))*B*n/(a^3*b^5*c^6*g^4 - 5*a^4*b^4*c^5*d*g^4 + 10*a^5*b^3*c^4*d^2*g^4 -
10*a^6*b^2*c^3*d^3*g^4 + 5*a^7*b*c^2*d^4*g^4 - a^8*c*d^5*g^4 + (b^8*c^5*d*g
^4 - 5*a*b^7*c^4*d^2*g^4 + 10*a^2*b^6*c^3*d^3*g^4 - 10*a^3*b^5*c^2*d^4*g^4
+ 5*a^4*b^4*c*d^5*g^4 - a^5*b^3*d^6*g^4)*x^4 + (b^8*c^6*g^4 - 2*a*b^7*c^5*d
*g^4 - 5*a^2*b^6*c^4*d^2*g^4 + 20*a^3*b^5*c^3*d^3*g^4 - 25*a^4*b^4*c^2*d^4*
g^4 + 14*a^5*b^3*c*d^5*g^4 - 3*a^6*b^2*d^6*g^4)*x^3 + 3*(a*b^7*c^6*g^4 - 4*
a^2*b^6*c^5*d*g^4 + 5*a^3*b^5*c^4*d^2*g^4 - 5*a^5*b^3*c^2*d^4*g^4 + 4*a^6*b
^2*c*d^5*g^4 - a^7*b*d^6*g^4)*x^2 + (3*a^2*b^6*c^6*g^4 - 14*a^3*b^5*c^5*d*g
^4 + 25*a^4*b^4*c^4*d^2*g^4 - 20*a^5*b^3*c^3*d^3*g^4 + 5*a^6*b^2*c^2*d^4*g^
4 + 2*a^7*b*c*d^5*g^4 - a^8*d^6*g^4)*x) + 1/3*A*((12*b^3*d^3*x^3 + b^3*c^3
- 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*
x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6
*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*x^4 + (b^
7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c
*d^4 + 3*a^5*b^2*d^5)*g^4*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*
c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*x^2 + (3*a^2
*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*
b*c*d^4 + a^7*d^5)*g^4*x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d
^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4) + 12*b*d^3*log(b*x + a)/((b^5*c^5 -
5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a
^5*d^5)*g^4) - 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3
*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4))
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 1200 vs. $2(449) = 898$.

time = 0.41, size = 1200, normalized size = 2.52

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] 1/9*(3*(A + B)*b^4*c^4 - 18*(A + B)*a*b^3*c^3*d + 54*(A + B)*a^2*b^2*c^2*d^
2 - 30*(A + B)*a^3*b*c*d^3 - 9*(A + B)*a^4*d^4 + 6*(6*(A + B)*b^4*c*d^3 - 6
```

```
*(A + B)*a*b^3*d^4 + 5*(B*b^4*c*d^3 - B*a*b^3*d^4)*n)*x^3 + 3*(6*(A + B)*b^
4*c^2*d^2 + 24*(A + B)*a*b^3*c*d^3 - 30*(A + B)*a^2*b^2*d^4 + (11*B*b^4*c^2
*d^2 + 8*B*a*b^3*c*d^3 - 19*B*a^2*b^2*d^4)*n)*x^2 + 18*(B*b^4*d^4*n*x^4 + B
*a^3*b*c*d^3*n + (B*b^4*c*d^3 + 3*B*a*b^3*d^4)*n*x^3 + 3*(B*a*b^3*c*d^3 + B
*a^2*b^2*d^4)*n*x^2 + (3*B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*n*x)*log((b*x + a)/
(d*x + c))^2 + (B*b^4*c^4 - 9*B*a*b^3*c^3*d + 54*B*a^2*b^2*c^2*d^2 - 55*B*a
^3*b*c*d^3 + 9*B*a^4*d^4)*n - (6*(A + B)*b^4*c^3*d - 54*(A + B)*a*b^3*c^2*d
^2 - 18*(A + B)*a^2*b^2*c*d^3 + 66*(A + B)*a^3*b*d^4 + (5*B*b^4*c^3*d - 81*
B*a*b^3*c^2*d^2 + 57*B*a^2*b^2*c*d^3 + 19*B*a^3*b*d^4)*n)*x + 3*(12*(A + B)
*a^3*b*c*d^3 + 2*(5*B*b^4*d^4*n + 6*(A + B)*b^4*d^4)*x^4 + 2*(6*(A + B)*b^4
*c*d^3 + 18*(A + B)*a*b^3*d^4 + (11*B*b^4*c*d^3 + 9*B*a*b^3*d^4)*n)*x^3 + 6
*(6*(A + B)*a*b^3*c*d^3 + 6*(A + B)*a^2*b^2*d^4 + (B*b^4*c^2*d^2 + 9*B*a*b^
3*c*d^3)*n)*x^2 + (B*b^4*c^4 - 6*B*a*b^3*c^3*d + 18*B*a^2*b^2*c^2*d^2 - 3*B
*a^4*d^4)*n + 2*(18*(A + B)*a^2*b^2*c*d^3 + 6*(A + B)*a^3*b*d^4 - (B*b^4*c^
3*d - 9*B*a*b^3*c^2*d^2 - 18*B*a^2*b^2*c*d^3 + 6*B*a^3*b*d^4)*n)*x)*log((b*
x + a)/(d*x + c)))/((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b^6*c^3*d^3 - 10*
a^3*b^5*c^2*d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*x^4 + (b^8*c^6 - 2*a*b
^7*c^5*d - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*a^4*b^4*c^2*d^4 + 14
*a^5*b^3*c*d^5 - 3*a^6*b^2*d^6)*g^4*x^3 + 3*(a*b^7*c^6 - 4*a^2*b^6*c^5*d +
5*a^3*b^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c*d^5 - a^7*b*d^6)*g^4*x^
2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*b^4*c^4*d^2 - 20*a^5*b^3*c^3
*d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*d^6)*g^4*x + (a^3*b^5*c^6 -
5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a^6*b^2*c^3*d^3 + 5*a^7*b*c^2*d^4
 - a^8*c*d^5)*g^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 176.55, size = 377, normalized size = 0.79

$$\frac{1}{18}\left(\frac{6\left(Bb^2n-\frac{3\,(bx+a)Bbdn}{dx+c}+\frac{3\,(bx+a)^2Bd^2n}{(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^3b^2c^2g^4}{(dx+c)^3}-\frac{2\,(bx+a)^3abcdg^4}{(dx+c)^3}+\frac{(bx+a)^3a^2d^2g^4}{(dx+c)^3}}+\frac{2\,Bb^2n-\frac{9\,(bx+a)Bbdn}{dx+c}+\frac{18\,(bx+a)^2Bd^2n}{(dx+c)^2}+6\,Ab^2+6\,Bb^2-\frac{18\,(bx+a)Abd}{dx+c}-\frac{18\,(bx+a)Bbd}{dx+c}+\frac{18\,(bx+a)^2Ad^2}{(dx+c)^2}+\frac{18\,(bx+a)^2Bd^2}{(dx+c)^2}}{\frac{(bx+a)^3b^2c^2g^4}{(dx+c)^3}-\frac{2\,(bx+a)^3abcdg^4}{(dx+c)^3}+\frac{(bx+a)^3a^2d^2g^4}{(dx+c)^3}}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] 1/18*(6*(B*b^2*n - 3*(b*x + a)*B*b*d*n/(d*x + c) + 3*(b*x + a)^2*B*d^2*n/(d
*x + c)^2)*log((b*x + a)/(d*x + c))/((b*x + a)^3*b^2*c^2*g^4/(d*x + c)^3 -
```

2*(b*x + a)^3*a*b*c*d*g^4/(d*x + c)^3 + (b*x + a)^3*a^2*d^2*g^4/(d*x + c)^3
) + (2*B*b^2*n - 9*(b*x + a)*B*b*d*n/(d*x + c) + 18*(b*x + a)^2*B*d^2*n/(d*
x + c)^2 + 6*A*b^2 + 6*B*b^2 - 18*(b*x + a)*A*b*d/(d*x + c) - 18*(b*x + a)*
B*b*d/(d*x + c) + 18*(b*x + a)^2*A*d^2/(d*x + c)^2 + 18*(b*x + a)^2*B*d^2/(
d*x + c)^2)/((b*x + a)^3*b^2*c^2*g^4/(d*x + c)^3 - 2*(b*x + a)^3*a*b*c*d*g^
4/(d*x + c)^3 + (b*x + a)^3*a^2*d^2*g^4/(d*x + c)^3))*(b*c/(b*c - a*d)^2 -
a*d/(b*c - a*d)^2)^2

Mupad [B]
time = 9.93, size = 1665, normalized size = 3.49

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)^4*(c*i + d*i*x)^2
),x)

[Out] (2*B*b*d^3*log(e*((a + b*x)/(c + d*x))^n)^2)/(g^4*i^2*n*(a*d - b*c)^3*(a^2*
d^2 + b^2*c^2 - 2*a*b*c*d)) - log(e*((a + b*x)/(c + d*x))^n)*(((B*(3*a*d +
b*c))/(3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (4*B*b*d*x)/(3*(a^2*d^2 + b^2*c
^2 - 2*a*b*c*d)))/(x^3*(b^3*c*g^4*i^2 + 3*a*b^2*d*g^4*i^2) + x^2*(3*a*b^2*c
*g^4*i^2 + 3*a^2*b*d*g^4*i^2) + x*(a^3*d*g^4*i^2 + 3*a^2*b*c*g^4*i^2) + a^3
*c*g^4*i^2 + b^3*d*g^4*i^2*x^4) + (4*B*b*d^3*(x*((a*d + b*c)*((a*g^4*i^2*n*
(a*d - b*c))/(2*d) + (g^4*i^2*n*(a*d - b*c)*(2*a*d - b*c))/(2*d^2)) + (a*b*
c*g^4*i^2*n*(a*d - b*c))/d) + x^2*(b*d*((a*g^4*i^2*n*(a*d - b*c))/(2*d) + (
g^4*i^2*n*(a*d - b*c)*(2*a*d - b*c))/(2*d^2)) + (b*g^4*i^2*n*(a*d + b*c)*(a
*d - b*c))/d) + a*c*((a*g^4*i^2*n*(a*d - b*c))/(2*d) + (g^4*i^2*n*(a*d - b*
c)*(2*a*d - b*c))/(2*d^2)) + b^2*g^4*i^2*n*x^3*(a*d - b*c)))/(g^4*i^2*n*(a*
d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(x^3*(b^3*c*g^4*i^2 + 3*a*b^2*d*
g^4*i^2) + x^2*(3*a*b^2*c*g^4*i^2 + 3*a^2*b*d*g^4*i^2) + x*(a^3*d*g^4*i^2 +
 3*a^2*b*c*g^4*i^2) + a^3*c*g^4*i^2 + b^3*d*g^4*i^2*x^4))) - (b*d^3*atan((b
d^3((a^5*d^5*g^4*i^2 + b^5*c^5*g^4*i^2 - 3*a*b^4*c^4*d*g^4*i^2 - 3*a^4*b*
c*d^4*g^4*i^2 + 2*a^2*b^3*c^3*d^2*g^4*i^2 + 2*a^3*b^2*c^2*d^3*g^4*i^2)/(a^4
*d^4*g^4*i^2 + b^4*c^4*g^4*i^2 - 4*a*b^3*c^3*d*g^4*i^2 - 4*a^3*b*c*d^3*g^4*
i^2 + 6*a^2*b^2*c^2*d^2*g^4*i^2) + 2*b*d*x)*(6*A + 5*B*n)*(a^4*d^4*g^4*i^2
+ b^4*c^4*g^4*i^2 - 4*a*b^3*c^3*d*g^4*i^2 - 4*a^3*b*c*d^3*g^4*i^2 + 6*a^2*b
^2*c^2*d^2*g^4*i^2)*2i)/(g^4*i^2*(12*A*b*d^3 + 10*B*b*d^3*n)*(a*d - b*c)^5)
)*(6*A + 5*B*n)*4i)/(3*g^4*i^2*(a*d - b*c)^5) - ((9*A*a^3*d^3 + 3*A*b^3*c^3
 - 9*B*a^3*d^3*n + B*b^3*c^3*n - 15*A*a*b^2*c^2*d + 39*A*a^2*b*c*d^2 - 8*B*
a*b^2*c^2*d*n + 46*B*a^2*b*c*d^2*n)/(3*(a*d - b*c)) + (2*x^3*(6*A*b^3*d^3 +
 5*B*b^3*d^3*n))/(a*d - b*c) + (x*(66*A*a^2*b*d^3 - 6*A*b^3*c^2*d + 48*A*a*
b^2*c*d^2 + 19*B*a^2*b*d^3*n - 5*B*b^3*c^2*d*n + 76*B*a*b^2*c*d^2*n))/(3*(a
*d - b*c)) + (x^2*(30*A*a*b^2*d^3 + 6*A*b^3*c*d^2 + 19*B*a*b^2*d^3*n + 11*B
*b^3*c*d^2*n))/(a*d - b*c))/(x*(3*a^6*d^4*g^4*i^2 - 9*a^2*b^4*c^4*g^4*i^2 +
 24*a^3*b^3*c^3*d*g^4*i^2 - 18*a^4*b^2*c^2*d^2*g^4*i^2) - x^2*(9*a*b^5*c^4*

```
g^4*i^2 - 9*a^5*b*d^4*g^4*i^2 - 18*a^2*b^4*c^3*d*g^4*i^2 + 18*a^4*b^2*c*d^3
*g^4*i^2) - x^3*(3*b^6*c^4*g^4*i^2 - 9*a^4*b^2*d^4*g^4*i^2 + 24*a^3*b^3*c*d
^3*g^4*i^2 - 18*a^2*b^4*c^2*d^2*g^4*i^2) + x^4*(3*a^3*b^3*d^4*g^4*i^2 - 3*b
^6*c^3*d*g^4*i^2 + 9*a*b^5*c^2*d^2*g^4*i^2 - 9*a^2*b^4*c*d^3*g^4*i^2) - 3*a
^3*b^3*c^4*g^4*i^2 + 3*a^6*c*d^3*g^4*i^2 + 9*a^4*b^2*c^3*d*g^4*i^2 - 9*a^5*
b*c^2*d^2*g^4*i^2)
```

3.151 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=382

$$-\frac{3B(bc-ad)g^3n(a+bx)^2}{4d^2i^3(c+dx)^2}-\frac{3bB(bc-ad)g^3n(a+bx)}{d^3i^3(c+dx)}+\frac{b(bc-ad)g^3(3A+Bn)(a+bx)}{d^3i^3(c+dx)}+\frac{3bB(bc-ad)g^3(a}{d^3i^3(}$$

```
[Out] -3/4*B*(-a*d+b*c)*g^3*n*(b*x+a)^2/d^2/i^3/(d*x+c)^2-3*b*B*(-a*d+b*c)*g^3*n*
(b*x+a)/d^3/i^3/(d*x+c)+b*(-a*d+b*c)*g^3*(B*n+3*A)*(b*x+a)/d^3/i^3/(d*x+c)+
3*b*B*(-a*d+b*c)*g^3*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/d^3/i^3/(d*x+c)+g^3*
(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d/i^3/(d*x+c)^2+1/2*(-a*d+b*c)*g^
3*(b*x+a)^2*(3*A+B*n+3*B*ln(e*((b*x+a)/(d*x+c))^n))/d^2/i^3/(d*x+c)^2+b^2*(
-a*d+b*c)*g^3*(3*A+B*n+3*B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+
c))/d^4/i^3+3*b^2*B*(-a*d+b*c)*g^3*n*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i^3
```

Rubi [A]
time = 0.28, antiderivative size = 382, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.186$, Rules used = {2561, 2384, 45, 2393, 2332, 2341, 2354, 2438}

$$\frac{3b^2Bg^3n(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3}+\frac{b^2g^3(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{d^4i^3}+\frac{bg^3(a+bx)(3A+Bn)(bc-ad)}{d^3i^3(c+dx)}+\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{2d^2i^3(c+dx)^2}+\frac{g^3(a+bx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di^3(c+dx)^2}+\frac{3bBg^3(a+bx)(bc-ad)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^3i^3(c+dx)}-\frac{3bBg^3n(a+bx)(bc-ad)}{d^3i^3(c+dx)}-\frac{3Bg^3n(a+bx)^2(bc-ad)}{4d^2i^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^
3,x]
```

```
[Out] (-3*B*(b*c - a*d)*g^3*n*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (3*b*B*(b*c
- a*d)*g^3*n*(a + b*x))/(d^3*i^3*(c + d*x)) + (b*(b*c - a*d)*g^3*(3*A + B*n
)*(a + b*x))/(d^3*i^3*(c + d*x)) + (3*b*B*(b*c - a*d)*g^3*(a + b*x)*Log[e*(
(a + b*x)/(c + d*x))^n])/(d^3*i^3*(c + d*x)) + (g^3*(a + b*x)^3*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(d*i^3*(c + d*x)^2) + ((b*c - a*d)*g^3*(a + b*
x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*i^3*(c + d*x)
^2) + (b^2*(b*c - a*d)*g^3*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*n*Pol
yLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(151c+151dx)^3}\,dx = \int\left(\frac{b^3g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3442951d^3} + \frac{(-bc+ad)^3g^3\left(A+B\log\left(e\right.\right.}{3442951d^3(c+dx)}\right.$$

$$= \frac{(b^3g^3)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx}{3442951d^3} - \frac{(3b^2(bc-ad)g^3)\int\frac{A+B\log}{}}{3442951d^3}$$

$$= \frac{Ab^3g^3x}{3442951d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6885902d^4(c+dx)^2} - \frac{3b(bc-ad}{}$$

$$= \frac{Ab^3g^3x}{3442951d^3} + \frac{b^2Bg^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3442951d^3} + \frac{(bc-ad)^3g^3(A+}{6885902}$$

$$= \frac{Ab^3g^3x}{3442951d^3} + \frac{b^2Bg^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3442951d^3} + \frac{(bc-ad)^3g^3(A+}{6885902}$$

$$= \frac{Ab^3g^3x}{3442951d^3} - \frac{B(bc-ad)^3g^3n}{13771804d^4(c+dx)^2} + \frac{5bB(bc-ad)^2g^3n}{6885902d^4(c+dx)} + \frac{5b^2}{}$$

$$= \frac{Ab^3g^3x}{3442951d^3} - \frac{B(bc-ad)^3g^3n}{13771804d^4(c+dx)^2} + \frac{5bB(bc-ad)^2g^3n}{6885902d^4(c+dx)} + \frac{5b^2}{}$$

$$= \frac{Ab^3g^3x}{3442951d^3} - \frac{B(bc-ad)^3g^3n}{13771804d^4(c+dx)^2} + \frac{5bB(bc-ad)^2g^3n}{6885902d^4(c+dx)} + \frac{5b^2}{}$$

Mathematica [A]
time = 0.29, size = 334, normalized size = 0.87

$$\frac{g^3\left(4Ab^3dx - \frac{B(bc-ad)^3n}{(c+dx)^2} + \frac{10bB(bc-ad)^2n}{c+dx} + 10b^2B(bc-ad)n\log(a+bx) + 4b^2Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + \frac{2(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(c+dx)^2} - \frac{12b(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{c+dx} - 14b^2B(bc-ad)n\log(c+dx) - 12b^2(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx) + 6b^2B(bc-ad)n\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\operatorname{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{4d^4i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x)^3,x]
```

```
[Out] (g^3*(4*A*b^3*d*x - (B*(b*c - a*d)^3*n)/(c + d*x)^2 + (10*b*B*(b*c - a*d)^2
*n)/(c + d*x) + 10*b^2*B*(b*c - a*d)*n*Log[a + b*x] + 4*b^2*B*d*(a + b*x)*L
og[e*((a + b*x)/(c + d*x))^n] + (2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(c + d*x)^2 - (12*b*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(c + d*x) - 14*b^2*B*(b*c - a*d)*n*Log[c + d*x] - 12*b^2*(b*c
- a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 6*b^2*B*(b*c -
 a*d)*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
+ 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(4*d^4*i^3)
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2731 vs. 2(360) = 720.
time = 0.74, size = 2731, normalized size = 7.15

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] -(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(
d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c -
 a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*
c^2*d^2 - I*a*c*d^3)*x))*B*a^3*g^3*n - 3*B*a^2*b*g^3*n*((b^2*c - 2*a*b*d)*l
og(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c - 2*a*
b*d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b*c^2
- 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a*c^2*d^3 - 4*(I*b
*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) + A*b^3*g^3*((6*c^2
*d*x + 5*c^3)/(2*I*d^6*x^2 + 4*I*c*d^5*x + 2*I*c^2*d^4) + I*x/d^3 - 3*I*c*l
og(d*x + c)/d^4) - 3*A*a*b^2*g^3*((4*c*d*x + 3*c^2)/(2*I*d^5*x^2 + 4*I*c*d^
4*x + 2*I*c^2*d^3) - I*log(d*x + c)/d^3) + 3*(2*d*x + c)*B*a^2*b*g^3*log((b
*x/(d*x + c) + a/(d*x + c))^n*e)/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2)
+ 3*(2*d*x + c)*A*a^2*b*g^3/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + B*a
^3*g^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(2*I*d^3*x^2 + 4*I*c*d^2*x +
2*I*c^2*d) + A*a^3*g^3/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + 1/2*(a*b^4
*c^2*d*g^3*(19*I*n + 18*I) - 2*a^2*b^3*c*d^2*g^3*(7*I*n + 9*I) + b^5*c^3*g^
3*(-7*I*n - 6*I) + 6*I*a^3*b^2*d^3*g^3)*B*log(d*x + c)/(b^2*c^2*d^4 - 2*a*b
*c*d^5 + a^2*d^6) + 1/4*(4*(I*b^5*c^2*d^3*g^3 - 2*I*a*b^4*c*d^4*g^3 + I*a^2
*b^3*d^5*g^3)*B*x^3 + 8*(I*b^5*c^3*d^2*g^3 - 2*I*a*b^4*c^2*d^3*g^3 + I*a^2*
b^3*c*d^4*g^3)*B*x^2 + 2*(a^2*b^3*c^2*d^3*g^3*(27*I*n - 28*I) + b^5*c^4*d*g
^3*(5*I*n - 4*I) + 20*a*b^4*c^3*d^2*g^3*(-I*n + I) + 12*a^3*b^2*c*d^4*g^3*(
-I*n + I))*B*x + 12*((I*b^5*c^3*d^2*g^3*n - 3*I*a*b^4*c^2*d^3*g^3*n + 3*I*a
^2*b^3*c*d^4*g^3*n - I*a^3*b^2*d^5*g^3*n)*B*x^2 + 2*(I*b^5*c^4*d*g^3*n - 3*
I*a*b^4*c^3*d^2*g^3*n + 3*I*a^2*b^3*c^2*d^3*g^3*n - I*a^3*b^2*c*d^4*g^3*n)*
```

```
B*x + (I*b^5*c^5*g^3*n - 3*I*a*b^4*c^4*d*g^3*n + 3*I*a^2*b^3*c^3*d^2*g^3*n
- I*a^3*b^2*c^2*d^3*g^3*n)*B)*log(b*x + a)*log(d*x + c) + 6*((-I*b^5*c^3*d^
2*g^3*n + 3*I*a*b^4*c^2*d^3*g^3*n - 3*I*a^2*b^3*c*d^4*g^3*n + I*a^3*b^2*d^5
*g^3*n)*B*x^2 + 2*(-I*b^5*c^4*d*g^3*n + 3*I*a*b^4*c^3*d^2*g^3*n - 3*I*a^2*b
^3*c^2*d^3*g^3*n + I*a^3*b^2*c*d^4*g^3*n)*B*x + (-I*b^5*c^5*g^3*n + 3*I*a*b
^4*c^4*d*g^3*n - 3*I*a^2*b^3*c^3*d^2*g^3*n + I*a^3*b^2*c^2*d^3*g^3*n)*B)*lo
g(d*x + c)^2 - (a*b^4*c^4*d*g^3*(35*I*n - 38*I) - 3*a^3*b^2*c^2*d^3*g^3*(-7
*I*n + 6*I) + b^5*c^5*g^3*(-9*I*n + 10*I) + a^2*b^3*c^3*d^2*g^3*(-47*I*n +
46*I))*B + 2*((5*I*b^5*c^3*d^2*g^3*n - 13*I*a*b^4*c^2*d^3*g^3*n + 8*I*a^2*b
^3*c*d^4*g^3*n + 2*I*a^3*b^2*d^5*g^3*n)*B*x^2 + 2*(5*I*b^5*c^4*d*g^3*n - 13
*I*a*b^4*c^3*d^2*g^3*n + 8*I*a^2*b^3*c^2*d^3*g^3*n + 2*I*a^3*b^2*c*d^4*g^3*
n)*B*x + (5*I*b^5*c^5*g^3*n - 13*I*a*b^4*c^4*d*g^3*n + 8*I*a^2*b^3*c^3*d^2*
g^3*n + 2*I*a^3*b^2*c^2*d^3*g^3*n)*B)*log(b*x + a) + 2*(2*(I*b^5*c^2*d^3*g^
3 - 2*I*a*b^4*c*d^4*g^3 + I*a^2*b^3*d^5*g^3)*B*x^3 + 4*(I*b^5*c^3*d^2*g^3 -
 2*I*a*b^4*c^2*d^3*g^3 + I*a^2*b^3*c*d^4*g^3)*B*x^2 + 4*(-I*b^5*c^4*d*g^3 +
 5*I*a*b^4*c^3*d^2*g^3 - 7*I*a^2*b^3*c^2*d^3*g^3 + 3*I*a^3*b^2*c*d^4*g^3)*B
*x + (-5*I*b^5*c^5*g^3 + 19*I*a*b^4*c^4*d*g^3 - 23*I*a^2*b^3*c^3*d^2*g^3 +
9*I*a^3*b^2*c^2*d^3*g^3)*B + 6*((-I*b^5*c^3*d^2*g^3 + 3*I*a*b^4*c^2*d^3*g^3
 - 3*I*a^2*b^3*c*d^4*g^3 + I*a^3*b^2*d^5*g^3)*B*x^2 + 2*(-I*b^5*c^4*d*g^3 +
 3*I*a*b^4*c^3*d^2*g^3 - 3*I*a^2*b^3*c^2*d^3*g^3 + I*a^3*b^2*c*d^4*g^3)*B*x
 + (-I*b^5*c^5*g^3 + 3*I*a*b^4*c^4*d*g^3 - 3*I*a^2*b^3*c^3*d^2*g^3 + I*a^3*
b^2*c^2*d^3*g^3)*B)*log(d*x + c))*log((b*x + a)^n) + 2*(2*(-I*b^5*c^2*d^3*g
^3 + 2*I*a*b^4*c*d^4*g^3 - I*a^2*b^3*d^5*g^3)*B*x^3 + 4*(-I*b^5*c^3*d^2*g^3
 + 2*I*a*b^4*c^2*d^3*g^3 - I*a^2*b^3*c*d^4*g^3)*B*x^2 + 4*(I*b^5*c^4*d*g^3
- 5*I*a*b^4*c^3*d^2*g^3 + 7*I*a^2*b^3*c^2*d^3*g^3 - 3*I*a^3*b^2*c*d^4*g^3)*
B*x + (5*I*b^5*c^5*g^3 - 19*I*a*b^4*c^4*d*g^3 + 23*I*a^2*b^3*c^3*d^2*g^3 -
9*I*a^3*b^2*c^2*d^3*g^3)*B + 6*((I*b^5*c^3*d^2*g^3 - 3*I*a*b^4*c^2*d^3*g^3
+ 3*I*a^2*b^3*c*d^4*g^3 - I*a^3*b^2*d^5*g^3)*B*x^2 + 2*(I*b^5*c^4*d*g^3 - 3
*I*a*b^4*c^3*d^2*g^3 + 3*I*a^2*b^3*c^2*d^3*g^3 - I*a^3*b^2*c*d^4*g^3)*B*x +
 (I*b^5*c^5*g^3 - 3*I*a*b^4*c^4*d*g^3 + 3*I*a^2*b^3*c^3*d^2*g^3 - I*a^3*b^2
*c^2*d^3*g^3)*B)*log(d*x + c))*log((d*x + c)^n))/(b^2*c^4*d^4 - 2*a*b*c^3*d
^5 + a^2*c^2*d^6 + (b^2*c^2*d^6 - 2*a*b*c*d^7 + a^2*d^8)*x^2 + 2*(b^2*c^3*d
^5 - 2*a*b*c^2*d^6 + a^2*c*d^7)*x) - 3*(I*b^3*c*g^3*n - I*a*b^2*d*g^3*n)*(l
og(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c
- a*d)))*B/d^4
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] integral(((I*A + I*B)*b^3*g^3*x^3 - 3*(-I*A - I*B)*a*b^2*g^3*x^2 - 3*(-I*A
- I*B)*a^2*b*g^3*x + (I*A + I*B)*a^3*g^3 + (I*B*b^3*g^3*n*x^3 + 3*I*B*a*b^2
*g^3*n*x^2 + 3*I*B*a^2*b*g^3*n*x + I*B*a^3*g^3*n)*log((b*x + a)/(d*x + c)))
/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Sympy [F]

time = 0.00, size = 0, normalized size = 0.00

$$\frac{g^3\left(\int \frac{Aa^3}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{Ab^3x^3}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{Ba^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{3Aab^2x^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{3Aa^2bx}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{Bb^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{3Bab^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{3Ba^2bx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx\right)}{i^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**3,x)
```

```
[Out] g**3*(Integral(A*a**3/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) +
 Integral(A*b**3*x**3/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) +
 Integral(B*a**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**3 + 3*c**2*d*x
 + 3*c*d**2*x**2 + d**3*x**3), x) + Integral(3*A*a*b**2*x**2/(c**3 + 3*c**2
*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integral(3*A*a**2*b*x/(c**3 + 3*c**
2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integral(B*b**3*x**3*log(e*(a/(c +
 d*x) + b*x/(c + d*x))**n)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3),
 x) + Integral(3*B*a*b**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**
3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integral(3*B*a**2*b*x*log
(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d
**3*x**3), x))/i**3
```

Giac [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(I*d*x + I
*c)^3, x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{\left(c\,i+d\,i\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
3,x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
3, x)
```

3.152 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=263

$$\frac{Bg^2n(a+bx)^2}{4di^3(c+dx)^2}-\frac{Abg^2(a+bx)}{d^2i^3(c+dx)}+\frac{bBg^2n(a+bx)}{d^2i^3(c+dx)}-\frac{bBg^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^2i^3(c+dx)}-\frac{g^2(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2di^3(c+dx)^2}$$

```
[Out] 1/4*B*g^2*n*(b*x+a)^2/d/i^3/(d*x+c)^2-A*b*g^2*(b*x+a)/d^2/i^3/(d*x+c)+b*B*g
^2*n*(b*x+a)/d^2/i^3/(d*x+c)-b*B*g^2*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/d^2/
i^3/(d*x+c)-1/2*g^2*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d/i^3/(d*x+c)
^2-b^2*g^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/d^3/i^3
-b^2*B*g^2*n*polylog(2,d*(b*x+a)/b/(d*x+c))/d^3/i^3
```

Rubi [A]

time = 0.18, antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.163$, Rules used = {2561, 45, 2393, 2332, 2341, 2354, 2438}

$$-\frac{b^2Bg^2n\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^3}-\frac{b^2g^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^3}-\frac{g^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2di^3(c+dx)^2}-\frac{Abg^2(a+bx)}{d^2i^3(c+dx)}-\frac{bBg^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^2i^3(c+dx)}+\frac{bBg^2n(a+bx)}{d^2i^3(c+dx)}+\frac{Bg^2n(a+bx)^2}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^
3,x]
```

```
[Out] (B*g^2*n*(a + b*x)^2)/(4*d*i^3*(c + d*x)^2) - (A*b*g^2*(a + b*x))/(d^2*i^3*
(c + d*x)) + (b*B*g^2*n*(a + b*x))/(d^2*i^3*(c + d*x)) - (b*B*g^2*(a + b*x)
*Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i^3*(c + d*x)) - (g^2*(a + b*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i^3*(c + d*x)^2) - (b^2*g^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^3)
 - (b^2*B*g^2*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(152c+152dx)^3}\,dx = \int\left(\frac{(-bc+ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3511808d^2(c+dx)^3} - \frac{b(bc-ad)g^2(A+}{1755904d}\right.$$

$$= \frac{(b^2g^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{3511808d^2} - \frac{(b(bc-ad)g^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}}{1755904d^2}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7023616d^3(c+dx)^2} + \frac{b(bc-ad)g^2(A+B\log}{1755904d^3(c+}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7023616d^3(c+dx)^2} + \frac{b(bc-ad)g^2(A+B\log}{1755904d^3(c+}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7023616d^3(c+dx)^2} + \frac{b(bc-ad)g^2(A+B\log}{1755904d^3(c+}$$

$$= \frac{B(bc-ad)^2g^2n}{14047232d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n}{7023616d^3(c+dx)} - \frac{3b^2Bg^2n\log(a+}{7023616d^3}$$

$$= \frac{B(bc-ad)^2g^2n}{14047232d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n}{7023616d^3(c+dx)} - \frac{3b^2Bg^2n\log(a+}{7023616d^3}$$

$$= \frac{B(bc-ad)^2g^2n}{14047232d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n}{7023616d^3(c+dx)} - \frac{3b^2Bg^2n\log(a+}{7023616d^3}$$

Mathematica [A]
time = 0.23, size = 259, normalized size = 0.98

$$\frac{g^2\left(\frac{B(bc-ad)^2n}{(c+dx)^2} - \frac{6bB(bc-ad)n}{c+dx} - 6b^2Bn\log(a+bx) - \frac{2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(c+dx)^2} + \frac{8b(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{c+dx} + 6b^2Bn\log(c+dx) + 4b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx) - 2b^2Bn\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right) - \log(c+dx)\right)\log(c+dx) + 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{4d^3i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x)^3,x]

[Out] (g^2*((B*(b*c - a*d)^2*n)/(c + d*x)^2 - (6*b*B*(b*c - a*d)*n)/(c + d*x) - 6
*b^2*B*n*Log[a + b*x] - (2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(c + d*x)^2 + (8*b*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(c + d*x) + 6*b^2*B*n*Log[c + d*x] + 4*b^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])*Log[c + d*x] - 2*b^2*B*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - L
og[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(4*d
^3*i^3)
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^2 \left(A+B\ln \left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] -(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(
d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c -
 a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*
c^2*d^2 - I*a*c*d^3)*x))*B*a^2*g^2*n - 2*B*a*b*g^2*n*((b^2*c - 2*a*b*d)*log
(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c - 2*a*b*
d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b*c^2 -
3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a*c^2*d^3 - 4*(I*b*c
*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) - A*b^2*g^2*((4*c*d*x
 + 3*c^2)/(2*I*d^5*x^2 + 4*I*c*d^4*x + 2*I*c^2*d^3) - I*log(d*x + c)/d^3) +
 1/2*B*b^2*g^2*((2*(-I*d^2*n*x^2 - 2*I*c*d*n*x - I*c^2*n)*log(b*x + a)*log(
d*x + c) - (-I*d^2*n*x^2 - 2*I*c*d*n*x - I*c^2*n)*log(d*x + c)^2 - (-4*I*c*
d*x - 3*I*c^2 - 2*(I*d^2*x^2 + 2*I*c*d*x + I*c^2)*log(d*x + c))*log((b*x +
a)^n) - (4*I*c*d*x + 3*I*c^2 - 2*(-I*d^2*x^2 - 2*I*c*d*x - I*c^2)*log(d*x +
 c))*log((d*x + c)^n))/(d^5*x^2 + 2*c*d^4*x + c^2*d^3) + 2*integrate(1/2*(2
*I*b*d^3*x^3 + 2*I*a*d^3*x^2 - 3*I*b*c^3*n + 3*I*a*c^2*d*n - 4*(I*b*c^2*d*n
 - I*a*c*d^2*n)*x - 2*(-I*b*d^3*n*x^3 - I*a*c^2*d*n + (-2*I*b*c*d^2*n - I*a
*d^3*n)*x^2 + (-I*b*c^2*d*n - 2*I*a*c*d^2*n)*x)*log(b*x + a))/(b*d^6*x^4 +
a*c^3*d^3 + (3*b*c*d^5 + a*d^6)*x^3 + 3*(b*c^2*d^4 + a*c*d^5)*x^2 + (b*c^3*
d^3 + 3*a*c^2*d^4)*x), x)) + 2*(2*d*x + c)*B*a*b*g^2*log((b*x/(d*x + c) + a
/(d*x + c))^n*e)/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + 2*(2*d*x + c)*
A*a*b*g^2/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + B*a^2*g^2*log((b*x/(d
*x + c) + a/(d*x + c))^n*e)/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + A*a^2
*g^2/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] integral(((I*A + I*B)*b^2*g^2*x^2 - 2*(-I*A - I*B)*a*b*g^2*x + (I*A + I*B)*
a^2*g^2 + (I*B*b^2*g^2*n*x^2 + 2*I*B*a*b*g^2*n*x + I*B*a^2*g^2*n)*log((b*x
+ a)/(d*x + c)))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g^2\left(\int \frac{Aa^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{Ab^2x^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{Ba^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{2Aabx}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{Bb^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{2Babx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx\right)}{i^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**3,x)
```

```
[Out] g**2*(Integral(A*a**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) +
 Integral(A*b**2*x**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) +
 Integral(B*a**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**3 + 3*c**2*d*x
 + 3*c*d**2*x**2 + d**3*x**3), x) + Integral(2*A*a*b*x/(c**3 + 3*c**2*d*x +
 3*c*d**2*x**2 + d**3*x**3), x) + Integral(B*b**2*x**2*log(e*(a/(c + d*x) +
 b*x/(c + d*x))**n)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + I
ntegral(2*B*a*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**3 + 3*c**2*d*
x + 3*c*d**2*x**2 + d**3*x**3), x))/i**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)/(I*d*x + I
*c)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{\left(c\,i+d\,i\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
3,x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
3, x)
```

3.153 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=89

$$-\frac{Bgn(a+bx)^2}{4(bc-ad)i^3(c+dx)^2}+\frac{g(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2(bc-ad)i^3(c+dx)^2}$$

```
[Out] -1/4*B*g*n*(b*x+a)^2/(-a*d+b*c)/i^3/(d*x+c)^2+1/2*g*(b*x+a)^2*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))/(-a*d+b*c)/i^3/(d*x+c)^2
```

Rubi [A]
time = 0.05, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.049, Rules used = {2561, 2341}

$$\frac{g(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2i^3(c+dx)^2(bc-ad)}-\frac{Bgn(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^3,
x]
```

```
[Out] -1/4*(B*g*n*(a + b*x)^2)/((b*c - a*d)*i^3*(c + d*x)^2) + (g*(a + b*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*i^3*(c + d*x)^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(153c+153dx)^3}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3581577d(c+dx)^3} + \frac{bg\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{3581577d(c+dx}\right.$$

$$= \frac{(bg)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}\,dx}{3581577d} - \frac{((bc-ad)g)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^3}\,dx}{3581577d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7163154d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3581577d^2(c+dx)}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7163154d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3581577d^2(c+dx)}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7163154d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3581577d^2(c+dx)}$$

$$= -\frac{B(bc-ad)gn}{14326308d^2(c+dx)^2} + \frac{bBgn}{7163154d^2(c+dx)} + \frac{b^2Bgn\log(a+}{7163154d^2(bc-}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 215 vs. 2(89) = 178.
time = 0.11, size = 215, normalized size = 2.42

$$\frac{g\left(\frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d^2(c+dx)^2} - \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d^2(c+dx)} + \frac{bBn\left(\frac{1}{c+dx}+\frac{b\log(a+bx)}{bc-ad}-\frac{b\log(c+dx)}{bc-ad}\right)}{d^2} - \frac{Bn\left(\frac{bc-ad}{(c+dx)^2}+\frac{2b}{c+dx}+\frac{2b^2\log(a+bx)}{bc-ad}-\frac{2b^2\log(c+dx)}{bc-ad}\right)}{4d^2}\right)}{i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i
*x)^3,x]
```

```
[Out] (g*(((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*(c + d*x)^2
) - (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*(c + d*x)) + (b*B*n*((c
 + d*x)^(-1) + (b*Log[a + b*x])/(b*c - a*d) - (b*Log[c + d*x])/(b*c - a*d))
)/d^2 - (B*n*((b*c - a*d)/(c + d*x)^2 + (2*b)/(c + d*x) + (2*b^2*Log[a + b*
x])/(b*c - a*d) - (2*b^2*Log[c + d*x])/(b*c - a*d)))/(4*d^2)))/i^3
```

Maple [F]
time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 530 vs. $2(80) = 160$.
time = 0.31, size = 530, normalized size = 5.96

$$-\left(\frac{b^2\log(bx+a)}{2i\,b^2c^2d-4i\,abcd^2+2i\,a^2d^3}-\frac{b^2\log(dx+c)}{2i\,b^2c^2d-4i\,abcd^2+2i\,a^2d^3}-\frac{2\,bdx+3\,bc-ad}{-4i\,bc^3d+4i\,ac^2d^2-4\,(i\,bcd^3-i\,ad^4)x^2-8\,(i\,bc^2d^2-i\,acd^3)x}\right)Bagn-Bbgn\left(\frac{(b^2c-2\,abd)\log(bx+a)}{2i\,b^2c^2d^2-4i\,abcd^3+2i\,a^2d^4}-\frac{(b^2c-2\,abd)\log(dx+c)}{2i\,b^2c^2d^2-4i\,abcd^3+2i\,a^2d^4}-\frac{bc^2-3\,acd+2\,(bcd-2\,ad^2)x}{-4i\,bc^3d^2+4i\,ac^2d^3-4\,(i\,bcd^4-i\,ad^5)x^2-8\,(i\,bc^2d^3-i\,acd^4)x}\right)+\frac{(2\,dx+c)Bbg\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)}{2i\,d^4x^2+4i\,cd^3x+2i\,c^2d^2}+\frac{(2\,dx+c)Abg}{2i\,d^4x^2+4i\,cd^3x+2i\,c^2d^2}+\frac{Bag\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)}{2i\,d^3x^2+4i\,cd^2x+2i\,c^2d}+\frac{Aag}{2i\,d^3x^2+4i\,cd^2x+2i\,c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] -(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(
d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c -
 a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*
c^2*d^2 - I*a*c*d^3)*x))*B*a*g*n - B*b*g*n*((b^2*c - 2*a*b*d)*log(b*x + a)/
(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c - 2*a*b*d)*log(d*x
 + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b*c^2 - 3*a*c*d +
2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a*c^2*d^3 - 4*(I*b*c*d^4 - I*a
*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) + (2*d*x + c)*B*b*g*log((b*x/(d
*x + c) + a/(d*x + c))^n*e)/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + (2*
d*x + c)*A*b*g/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + B*a*g*log((b*x/(
d*x + c) + a/(d*x + c))^n*e)/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + A*a*
g/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 220 vs. $2(80) = 160$.
time = 0.42, size = 220, normalized size = 2.47

$$-\frac{(-i\,Bb^2c^2+i\,Ba^2d^2)gn-2\,((-i\,A-i\,B)b^2c^2+(i\,A+i\,B)a^2d^2)g-2\,((i\,Bb^2cd-i\,Babd^2)gn+2\,((-i\,A-i\,B)b^2cd+(i\,A+i\,B)abd^2)g)x-2\,(i\,Bb^2d^2gnx^2+2i\,Babd^2gnx+i\,Ba^2d^2gn)\log\left(\frac{bx+a}{dx+c}\right)}{4\,(bc^3d^2-ac^2d^3+(bcd^4-ad^5)x^2+2\,(bc^2d^3-acd^4)x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] -1/4*((-I*B*b^2*c^2 + I*B*a^2*d^2)*g*n - 2*((-I*A - I*B)*b^2*c^2 + (I*A + I
*B)*a^2*d^2)*g - 2*((I*B*b^2*c*d - I*B*a*b*d^2)*g*n + 2*((-I*A - I*B)*b^2*c
*d + (I*A + I*B)*a*b*d^2)*g)*x - 2*(I*B*b^2*d^2*g*n*x^2 + 2*I*B*a*b*d^2*g*n
*x + I*B*a^2*d^2*g*n)*log((b*x + a)/(d*x + c)))/(b*c^3*d^2 - a*c^2*d^3 + (b
*c*d^4 - a*d^5)*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.63, size = 93, normalized size = 1.04

$$-\frac{1}{4}\left(-\frac{2i\,(bx+a)^2Bgn\log\left(\frac{bx+a}{dx+c}\right)}{(dx+c)^2}+\frac{(i\,Bgn-2i\,Ag-2i\,Bg)(bx+a)^2}{(dx+c)^2}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] -1/4*(-2*I*(b*x + a)^2*B*g*n*log((b*x + a)/(d*x + c))/(d*x + c)^2 + (I*B*g*
n - 2*I*A*g - 2*I*B*g)*(b*x + a)^2/(d*x + c)^2)*(b*c/(b*c - a*d)^2 - a*d/(b
*c - a*d)^2)
```

Mupad [B]
time = 5.49, size = 205, normalized size = 2.30

$$-\frac{x\,\left(2\,A\,b\,d\,g-B\,b\,d\,g\,n\right)+A\,a\,d\,g+A\,b\,c\,g-\frac{B\,a\,d\,g\,n}{2}-\frac{B\,b\,c\,g\,n}{2}}{2\,c^2\,d^2\,i^3+4\,c\,d^3\,i^3\,x+2\,d^4\,i^3\,x^2}-\frac{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,\left(\frac{B\,a\,g}{2\,d}+\frac{B\,b\,c\,g}{2\,d^2}+\frac{B\,b\,g\,x}{d}\right)}{c^2\,i^3+2\,c\,d\,i^3\,x+d^2\,i^3\,x^2}+\frac{B\,b^2\,g\,n\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,1\mathrm{i}}{d^2\,i^3\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^3,
x)
```

```
[Out] (B*b^2*g*n*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*1i)/(d^2*i^3*(a*d - b
*c)) - (log(e*((a + b*x)/(c + d*x))^n)*((B*a*g)/(2*d) + (B*b*c*g)/(2*d^2) +
 (B*b*g*x)/d))/(c^2*i^3 + d^2*i^3*x^2 + 2*c*d*i^3*x) - (x*(2*A*b*d*g - B*b*
d*g*n) + A*a*d*g + A*b*c*g - (B*a*d*g*n)/2 - (B*b*c*g*n)/2)/(2*c^2*d^2*i^3
+ 2*d^4*i^3*x^2 + 4*c*d^3*i^3*x)
```

3.154 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=151

$$\frac{Bn}{4di^3(c+dx)^2}+\frac{bBn}{2d(bc-ad)i^3(c+dx)}+\frac{b^2Bn\log(a+bx)}{2d(bc-ad)^2i^3}-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2di^3(c+dx)^2}-\frac{b^2Bn\log(c+dx)}{2d(bc-ad)^2i^3}$$

```
[Out] 1/4*B*n/d/i^3/(d*x+c)^2+1/2*b*B*n/d/(-a*d+b*c)/i^3/(d*x+c)+1/2*b^2*B*n*ln(b
*x+a)/d/(-a*d+b*c)^2/i^3+1/2*(-A-B*ln(e*((b*x+a)/(d*x+c))^n))/d/i^3/(d*x+c)
^2-1/2*b^2*B*n*ln(d*x+c)/d/(-a*d+b*c)^2/i^3
```

Rubi [A]
time = 0.08, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2547, 21, 46}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2di^3(c+dx)^2}+\frac{b^2Bn\log(a+bx)}{2di^3(bc-ad)^2}-\frac{b^2Bn\log(c+dx)}{2di^3(bc-ad)^2}+\frac{bBn}{2di^3(c+dx)(bc-ad)}+\frac{Bn}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x)^3,x]
```

```
[Out] (B*n)/(4*d*i^3*(c + d*x)^2) + (b*B*n)/(2*d*(b*c - a*d)*i^3*(c + d*x)) + (b^
2*B*n*Log[a + b*x])/(2*d*(b*c - a*d)^2*i^3) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])/(2*d*i^3*(c + d*x)^2) - (b^2*B*n*Log[c + d*x])/(2*d*(b*c - a*d)^2
*i^3)
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2547

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Simp[(f + g*x)^(m + 1)*((A +
```

```
B*Log[e*((a + b*x)/(c + d*x))^n])/(g*(m + 1))), x] - Dist[B*n*((b*c - a*d)
/(g*(m + 1))), Int[(f + g*x)^(m + 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ
[{a, b, c, d, e, f, g, A, B, m, n}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &
& NeQ[m, -2]
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(154c+154dx)^3}\,dx &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d(c+dx)^2}+\frac{(Bn)\int\frac{bc-ad}{23716(a+bx)(c+dx)^3}\,dx}{308d}\\
&= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d(c+dx)^2}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)^3}\,dx}{7304528d}\\
&= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d(c+dx)^2}+\frac{(B(bc-ad)n)\int\left(\frac{b^3}{(bc-ad)^3(a+bx)}-\frac{d}{(bc-ad)(c+dx)^3}-\frac{}{(b}\right.}{7304528d}\\
&= \frac{Bn}{14609056d(c+dx)^2}+\frac{bBn}{7304528d(bc-ad)(c+dx)}+\frac{b^2Bn\log(a+bx)}{7304528d(bc-ad)^2}-
\end{aligned}$$

Mathematica [A]
time = 0.09, size = 115, normalized size = 0.76

$$\frac{-2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+\frac{Bn\left((bc-ad)(3bc-ad+2bdx)+2b^2(c+dx)^2\log(a+bx)-2b^2(c+dx)^2\log(c+dx)\right)}{(bc-ad)^2}}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x)^3,x]
[Out] (-2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (B*n*((b*c - a*d)*(3*b*c - a*d
 + 2*b*d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*
x]))/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^2)
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int\frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

Maxima [A]
time = 0.27, size = 235, normalized size = 1.56

$$-\left(\frac{b^2\log(bx+a)}{2i\,b^2c^2d-4i\,abcd^2+2i\,a^2d^3}-\frac{b^2\log(dx+c)}{2i\,b^2c^2d-4i\,abcd^2+2i\,a^2d^3}-\frac{2\,bdx+3\,bc-ad}{-4i\,bc^3d+4i\,ac^2d^2-4\,(i\,bcd^3-i\,ad^4)x^2-8\,(i\,bc^2d^2-i\,acd^3)x}\right)Bn+\frac{B\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)}{2i\,d^3x^2+4i\,cd^2x+2i\,c^2d}+\frac{A}{2i\,d^3x^2+4i\,cd^2x+2i\,c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, algorithm="maxi
ma")
```

```
[Out] -(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(
d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c -
 a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*
c^2*d^2 - I*a*c*d^3)*x))*B*n + B*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(2*
I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + A/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c
^2*d)
```

Fricas [A]
time = 0.40, size = 248, normalized size = 1.64

$$-\frac{2\,(i\,A+i\,B)b^2c^2+4\,(-i\,A-i\,B)abcd+2\,(i\,A+i\,B)a^2d^2+2\,(-i\,Bb^2cd+i\,Babd^2)nx-(3i\,Bb^2c^2-4i\,Babcd+i\,Ba^2d^2)n+2\,(-i\,Bb^2d^2nx^2-2i\,Bb^2cdnx+(-2i\,Babcd+i\,Ba^2d^2)n)\log\left(\frac{bx+a}{dx+c}\right)}{4\,(b^2c^4d-2\,abc^3d^2+a^2c^2d^3+(b^2c^2d^3-2\,abcd^4+a^2d^5)x^2+2\,(b^2c^3d^2-2\,abc^2d^3+a^2cd^4)x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, algorithm="fric
as")
```

```
[Out] -1/4*(2*(I*A + I*B)*b^2*c^2 + 4*(-I*A - I*B)*a*b*c*d + 2*(I*A + I*B)*a^2*d^
2 + 2*(-I*B*b^2*c*d + I*B*a*b*d^2)*n*x - (3*I*B*b^2*c^2 - 4*I*B*a*b*c*d + I
*B*a^2*d^2)*n + 2*(-I*B*b^2*d^2*n*x^2 - 2*I*B*b^2*c*d*n*x + (-2*I*B*a*b*c*d
 + I*B*a^2*d^2)*n)*log((b*x + a)/(d*x + c)))/(b^2*c^4*d - 2*a*b*c^3*d^2 + a
^2*c^2*d^3 + (b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*x^2 + 2*(b^2*c^3*d^2 - 2
*a*b*c^2*d^3 + a^2*c*d^4)*x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [A]
time = 2.58, size = 181, normalized size = 1.20

$$-\frac{1}{4}\left(2\left(-\frac{2i\,(bx+a)Bbn}{(bc-ad)(dx+c)}+\frac{i\,(bx+a)^2Bdn}{(bc-ad)(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)+\frac{(-i\,Bdn+2i\,Ad+2i\,Bd)(bx+a)^2}{(bc-ad)(dx+c)^2}+\frac{4\,(i\,Bbn-i\,Ab-i\,Bb)(bx+a)}{(bc-ad)(dx+c)}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, algorithm="giac
")
```

```
[Out] -1/4*(2*(-2*I*(b*x + a)*B*b*n/((b*c - a*d)*(d*x + c)) + I*(b*x + a)^2*B*d*n
/((b*c - a*d)*(d*x + c)^2))*log((b*x + a)/(d*x + c)) + (-I*B*d*n + 2*I*A*d
+ 2*I*B*d)*(b*x + a)^2/((b*c - a*d)*(d*x + c)^2) + 4*(I*B*b*n - I*A*b - I*B
*b)*(b*x + a)/((b*c - a*d)*(d*x + c)))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)
^2)
```

Mupad [B]
time = 4.97, size = 221, normalized size = 1.46

$$\frac{B\,b^2\,n\,\mathrm{atanh}\left(\frac{2\,a^2\,d^3\,i^3-2\,b^2\,c^2\,d\,i^3}{2\,d\,i^3\,{\left(a\,d-b\,c\right)}^2}+\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{d\,i^3\,{\left(a\,d-b\,c\right)}^2}-\frac{B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{2\,d\,\left(c^2\,i^3+2\,c\,d\,i^3\,x+d^2\,i^3\,x^2\right)}-\frac{\frac{2\,A\,a\,d-2\,A\,b\,c-B\,a\,d\,n+3\,B\,b\,c\,n}{2\,\left(a\,d-b\,c\right)}+\frac{B\,b\,d\,n\,x}{a\,d-b\,c}}{2\,c^2\,d\,i^3+4\,c\,d^2\,i^3\,x+2\,d^3\,i^3\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(c*i + d*i*x)^3,x)
```

```
[Out] (B*b^2*n*atanh((2*a^2*d^3*i^3 - 2*b^2*c^2*d*i^3)/(2*d*i^3*(a*d - b*c)^2) +
(2*b*d*x)/(a*d - b*c)))/(d*i^3*(a*d - b*c)^2) - (B*log(e*((a + b*x)/(c + d*
x))^n))/(2*d*(c^2*i^3 + d^2*i^3*x^2 + 2*c*d*i^3*x)) - ((2*A*a*d - 2*A*b*c -
 B*a*d*n + 3*B*b*c*n)/(2*(a*d - b*c)) + (B*b*d*n*x)/(a*d - b*c))/(2*c^2*d*i
^3 + 2*d^3*i^3*x^2 + 4*c*d^2*i^3*x)
```

3.155 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)^3}\,dx$

Optimal. Leaf size=254

$$-\frac{Bn\left(4b-\frac{d(a+bx)}{c+dx}\right)^2}{4(bc-ad)^3gi^3}+\frac{d^2(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2(bc-ad)^3gi^3(c+dx)^2}-\frac{2bd(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^3gi^3(c+dx)}+\frac{b^2(A+\ldots}{}$$

```
[Out] -1/4*B*n*(4*b-d*(b*x+a)/(d*x+c))^2/(-a*d+b*c)^3/g/i^3+1/2*d^2*(b*x+a)^2*(A+
B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g/i^3/(d*x+c)^2-2*b*d*(b*x+a)*(A+
B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g/i^3/(d*x+c)+b^2*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/(-a*d+b*c)^3/g/i^3-1/2*b^2*B*n*ln((b*x
+a)/(d*x+c))^2/(-a*d+b*c)^3/g/i^3
```

Rubi [A]

time = 0.15, antiderivative size = 254, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 45, 2372, 2338}

$$\frac{b^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{gi^3(bc-ad)^3}+\frac{d^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{2bd(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{gi^3(c+dx)(bc-ad)^3}-\frac{b^2Bn\log^2\left(\frac{a+bx}{c+dx}\right)}{2gi^3(bc-ad)^3}-\frac{Bn\left(4b-\frac{d(a+bx)}{c+dx}\right)^2}{4gi^3(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*x)^3),
x]
```

```
[Out] -1/4*(B*n*(4*b - (d*(a + b*x))/(c + d*x))^2)/((b*c - a*d)^3*g*i^3) + (d^2*(
a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g*i^3*(
c + d*x)^2) - (2*b*d*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*
c - a*d)^3*g*i^3*(c + d*x)) + (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*L
og[(a + b*x)/(c + d*x)])/((b*c - a*d)^3*g*i^3) - (b^2*B*n*Log[(a + b*x)/(c
+ d*x)]^2)/(2*(b*c - a*d)^3*g*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(155c+155dx)^3(ag+bgx)}\,dx = \int\left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)^3g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)g(c+dx)^3} - \frac{bd(}{3723}\right.$$

$$= \frac{b^3\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{3723875(bc-ad)^3g} - \frac{(b^2d)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{3723875(bc-ad)^3g} - \frac{(bd)\int\frac{A+B\log(}{(c+}}{3723875(bc}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7447750(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+}{}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7447750(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+}{}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7447750(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+}{}$$

$$= -\frac{Bn}{14895500(bc-ad)g(c+dx)^2} - \frac{3bBn}{7447750(bc-ad)^2g(c+dx)} - \frac{3b^2B}{74477}$$

$$= -\frac{Bn}{14895500(bc-ad)g(c+dx)^2} - \frac{3bBn}{7447750(bc-ad)^2g(c+dx)} - \frac{3b^2B}{74477}$$

$$= -\frac{Bn}{14895500(bc-ad)g(c+dx)^2} - \frac{3bBn}{7447750(bc-ad)^2g(c+dx)} - \frac{3b^2B}{74477}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.25, size = 434, normalized size = 1.71

$$\frac{2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+4b(bc-ad)(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+4b^2(c+dx)^2\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-4b^2(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)-4bBn(c+dx)(bc-ad+b(c+dx)\log(a+bx)-b(c+dx)\log(c+dx))-Bn((bc-ad)^2+2b(bc-ad)(c+dx)+2b^2(c+dx)^2\log(a+bx)-2b^2(c+dx)^2\log(c+dx))-2b^2Bn(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+2b^2Bn(c+dx)^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^3gi^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*
x)^3),x]
```

```
[Out] (2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b*(b*c - a*d)*(
c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b^2*(c + d*x)^2*Log[a +
 b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*b^2*(c + d*x)^2*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*b*B*n*(c + d*x)*(b*c - a*d +
b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2 +
 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*
x)^2*Log[c + d*x]) - 2*b^2*B*n*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*
Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)
]) + 2*b^2*B*n*(c + d*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c +
d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*
d)^3*g*i^3*(c + d*x)^2)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{(bgx+ag)\,(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 849 vs. 2(237) = 474.
time = 0.39, size = 849, normalized size = 3.34

$$\frac{1}{2}B\left(\frac{2b^2\log(bx+a)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g}-\frac{2b^2\log(dx+c)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g}+\frac{2bdx+3bc-ad}{(-ib^2c^2d^2+2iabcd^3-ia^2d^4)gx^2+2(-ib^2c^3d+2iabc^2d^2-ia^2cd^3)gx+(-ib^2c^4+2iabc^3d-ia^2c^2d^2)g}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)-\frac{\left(7ib^2c^2-8iabcd+ia^2d^2-2(-ib^2d^2x^2-2ib^2cdx-ib^2c^2)\log(bx+a)^2-2(-ib^2d^2x^2-2ib^2cdx-ib^2c^2)\log(dx+c)^2-6(-ib^2cd+iabd^2)x-6(-ib^2d^2x^2-2ib^2cdx-ib^2c^2)\log(bx+a)-2(3ib^2d^2x^2+6ib^2cdx+3ib^2c^2+2(ib^2d^2x^2+2ib^2cdx+ib^2c^2)\log(bx+a))\log(dx+c)\right)Bn}{4(b^3c^5g-3ab^2c^4dg+3a^2bc^3d^2g-a^3c^2d^3g+(b^3c^3d^2g-3ab^2c^2d^3g+3a^2bcd^4g-a^3d^5g)x^2+2(b^3c^4dg-3ab^2c^3d^2g+3a^2bc^2d^3g-a^3cd^4g)x)}+\frac{1}{2}A\left(\frac{2b^2\log(bx+a)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g}-\frac{2b^2\log(dx+c)}{(-ib^3c^3+3iab^2c^2d-3ia^2bcd^2+ia^3d^3)g}+\frac{2bdx+3bc-ad}{(-ib^2c^2d^2+2iabcd^3-ia^2d^4)gx^2+2(-ib^2c^3d+2iabc^2d^2-ia^2cd^3)gx+(-ib^2c^4+2iabc^3d-ia^2c^2d^2)g}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] 1/2*B*(2*b^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2
+ I*a^3*d^3)*g) - 2*b^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a
^2*b*c*d^2 + I*a^3*d^3)*g) + (2*b*d*x + 3*b*c - a*d)/((-I*b^2*c^2*d^2 + 2*I
*a*b*c*d^3 - I*a^2*d^4)*g*x^2 + 2*(-I*b^2*c^3*d + 2*I*a*b*c^2*d^2 - I*a^2*c
```

```
*d^3)*g*x + (-I*b^2*c^4 + 2*I*a*b*c^3*d - I*a^2*c^2*d^2)*g))*log((b*x/(d*x
+ c) + a/(d*x + c))^n*e) - 1/4*(7*I*b^2*c^2 - 8*I*a*b*c*d + I*a^2*d^2 - 2*(
-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a)^2 - 2*(-I*b^2*d^2*
x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(d*x + c)^2 - 6*(-I*b^2*c*d + I*a*b*d^2
)*x - 6*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a) - 2*(3*I*
b^2*d^2*x^2 + 6*I*b^2*c*d*x + 3*I*b^2*c^2 + 2*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*
x + I*b^2*c^2)*log(b*x + a))*log(d*x + c))*B*n/(b^3*c^5*g - 3*a*b^2*c^4*d*g
 + 3*a^2*b*c^3*d^2*g - a^3*c^2*d^3*g + (b^3*c^3*d^2*g - 3*a*b^2*c^2*d^3*g +
 3*a^2*b*c*d^4*g - a^3*d^5*g)*x^2 + 2*(b^3*c^4*d*g - 3*a*b^2*c^3*d^2*g + 3*
a^2*b*c^2*d^3*g - a^3*c*d^4*g)*x) + 1/2*A*(2*b^2*log(b*x + a)/((-I*b^3*c^3
+ 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) - 2*b^2*log(d*x + c)/((
-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) + (2*b*d*x +
 3*b*c - a*d)/((-I*b^2*c^2*d^2 + 2*I*a*b*c*d^3 - I*a^2*d^4)*g*x^2 + 2*(-I*b
^2*c^3*d + 2*I*a*b*c^2*d^2 - I*a^2*c*d^3)*g*x + (-I*b^2*c^4 + 2*I*a*b*c^3*d
 - I*a^2*c^2*d^2)*g))
```

Fricas [A]
time = 0.38, size = 435, normalized size = 1.71

$$\frac{6\,(i\,A+i\,B)b^2c^2+8\,(-i\,A-i\,B)abcd+2\,(i\,A+i\,B)a^2d^2+2\,(i\,Bb^2d^2nx^2+2i\,Bb^2cdnx+i\,Bb^2c^2n)\log\left(\frac{bx+a}{dx+c}\right)^2-(7i\,Bb^2c^2-8i\,Babcd+i\,Ba^2d^2)n+2\,(2\,(i\,A+i\,B)b^2cd+2\,(-i\,A-i\,B)abd^2+3\,(-i\,Bb^2cd+i\,Babd^2)n)x+2\,(2\,(i\,A+i\,B)b^2c^2+(-3i\,Bb^2d^2n+2\,(i\,A+i\,B)b^2d^2)x^2+(-4i\,Babcd+i\,Ba^2d^2)n+2\,(2\,(i\,A+i\,B)b^2cd+(-2i\,Bb^2cd-i\,Babd^2)n)x)\log\left(\frac{bx+a}{dx+c}\right)}{4\,((b^3c^3d^2-3\,ab^2c^2d^3+3\,a^2bcd^4-a^3d^5)gx^2+2\,(b^3c^4d-3\,ab^2c^3d^2+3\,a^2bc^2d^3-a^3cd^4)gx+(b^3c^5-3\,ab^2c^4d+3\,a^2bc^3d^2-a^3c^2d^3)g)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] 1/4*(6*(I*A + I*B)*b^2*c^2 + 8*(-I*A - I*B)*a*b*c*d + 2*(I*A + I*B)*a^2*d^2
 + 2*(I*B*b^2*d^2*n*x^2 + 2*I*B*b^2*c*d*n*x + I*B*b^2*c^2*n)*log((b*x + a)/
(d*x + c))^2 - (7*I*B*b^2*c^2 - 8*I*B*a*b*c*d + I*B*a^2*d^2)*n + 2*(2*(I*A
+ I*B)*b^2*c*d + 2*(-I*A - I*B)*a*b*d^2 + 3*(-I*B*b^2*c*d + I*B*a*b*d^2)*n)
*x + 2*(2*(I*A + I*B)*b^2*c^2 + (-3*I*B*b^2*d^2*n + 2*(I*A + I*B)*b^2*d^2)*
x^2 + (-4*I*B*a*b*c*d + I*B*a^2*d^2)*n + 2*(2*(I*A + I*B)*b^2*c*d + (-2*I*B
*b^2*c*d - I*B*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c)))/((b^3*c^3*d^2 - 3*a
*b^2*c^2*d^3 + 3*a^2*b*c*d^4 - a^3*d^5)*g*x^2 + 2*(b^3*c^4*d - 3*a*b^2*c^3*
d^2 + 3*a^2*b*c^2*d^3 - a^3*c*d^4)*g*x + (b^3*c^5 - 3*a*b^2*c^4*d + 3*a^2*b
*c^3*d^2 - a^3*c^2*d^3)*g)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.80, size = 362, normalized size = 1.43

$$-\frac{1}{4}\left(-\frac{2i\,Bb^2n\log\left(\frac{bx+a}{dx+c}\right)^2}{b^2c^2g-2\,abcdg+a^2d^2g}+2\left(\frac{4i\,(bx+a)Bbdn}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)}-\frac{i\,(bx+a)^2Bd^2n}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)+\frac{4\,(Ab^2+Bb^2)\log\left(\frac{bx+a}{dx+c}\right)}{i\,b^2c^2g-2i\,abcdg+i\,a^2d^2g}-\frac{(-i\,Bd^2n+2i\,Ad^2+2i\,Bd^2)(bx+a)^2}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)^2}+\frac{8\,(-i\,Bbdn+i\,Abd+i\,Bbd)(bx+a)}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] -1/4*(-2*I*B*b^2*n*log((b*x + a)/(d*x + c))^2/(b^2*c^2*g - 2*a*b*c*d*g + a^
2*d^2*g) + 2*(4*I*(b*x + a)*B*b*d*n/((b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*
(d*x + c)) - I*(b*x + a)^2*B*d^2*n/((b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(
d*x + c)^2))*log((b*x + a)/(d*x + c)) + 4*(A*b^2 + B*b^2)*log((b*x + a)/(d*
x + c))/(I*b^2*c^2*g - 2*I*a*b*c*d*g + I*a^2*d^2*g) - (-I*B*d^2*n + 2*I*A*d
^2 + 2*I*B*d^2)*(b*x + a)^2/((b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(d*x + c
)^2) + 8*(-I*B*b*d*n + I*A*b*d + I*B*b*d)*(b*x + a)/((b^2*c^2*g - 2*a*b*c*d
*g + a^2*d^2*g)*(d*x + c)))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 6.65, size = 573, normalized size = 2.26

$$\frac{B\,b^2\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,\left(\frac{c\,g\,i^3\,n\,\left(a\,d-b\,c\right)}{2\,b}-\frac{g\,i^3\,n\,\left(a\,d-b\,c\right)\,\left(a\,d-2\,b\,c\right)}{2\,b^2}+\frac{d\,g\,i^3\,n\,x\,\left(a\,d-b\,c\right)}{b}\right)}{g\,i^3\,n\,\left(a\,d-b\,c\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)\,\left(g\,c^2\,i^3+2\,g\,c\,d\,i^3\,x+g\,d^2\,i^3\,x^2\right)}-\frac{B\,b^2\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)^2}{2\,g\,i^3\,n\,\left(a\,d-b\,c\right)\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{\frac{2\,A\,a\,d-6\,A\,b\,c-B\,a\,d\,n+7\,B\,b\,c\,n}{2\,\left(a\,d-b\,c\right)}-\frac{b\,x\,\left(2\,A\,d-3\,B\,d\,n\right)}{a\,d-b\,c}}{x^2\,\left(2\,a\,d^3\,g\,i^3-2\,b\,c\,d^2\,g\,i^3\right)+x\,\left(4\,a\,c\,d^2\,g\,i^3-4\,b\,c^2\,d\,g\,i^3\right)-2\,b\,c^3\,g\,i^3+2\,a\,c^2\,d\,g\,i^3}+\frac{b^2\,\mathrm{atan}\left(\frac{b^2\,\left(A-\frac{3\,B\,n}{2}\right)\,\left(2\,g\,a^3\,d^3\,i^3-2\,g\,a^2\,b\,c\,d^2\,i^3-2\,g\,a\,b^2\,c^2\,d\,i^3+2\,g\,b^3\,c^3\,i^3\right)\,1{}\mathrm{i}}{g\,i^3\,\left(2\,A\,b^2-3\,B\,b^2\,n\right)\,{\left(a\,d-b\,c\right)}^3}+\frac{b^3\,d\,x\,\left(A-\frac{3\,B\,n}{2}\right)\,\left(g\,a^2\,d^2\,i^3-2\,g\,a\,b\,c\,d\,i^3+g\,b^2\,c^2\,i^3\right)\,4{}\mathrm{i}}{g\,i^3\,\left(2\,A\,b^2-3\,B\,b^2\,n\right)\,{\left(a\,d-b\,c\right)}^3}\right)\,\left(A-\frac{3\,B\,n}{2}\right)\,2{}\mathrm{i}}{g\,i^3\,{\left(a\,d-b\,c\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)*(c*i + d*i*x)^3),
x)
```

```
[Out] (b^2*atan((b^2*(A - (3*B*n)/2)*(2*a^3*d^3*g*i^3 + 2*b^3*c^3*g*i^3 - 2*a*b^2
*c^2*d*g*i^3 - 2*a^2*b*c*d^2*g*i^3)*1i)/(g*i^3*(2*A*b^2 - 3*B*b^2*n)*(a*d -
 b*c)^3) + (b^3*d*x*(A - (3*B*n)/2)*(a^2*d^2*g*i^3 + b^2*c^2*g*i^3 - 2*a*b*
c*d*g*i^3)*4i)/(g*i^3*(2*A*b^2 - 3*B*b^2*n)*(a*d - b*c)^3))*(A - (3*B*n)/2)
*2i)/(g*i^3*(a*d - b*c)^3) - ((2*A*a*d - 6*A*b*c - B*a*d*n + 7*B*b*c*n)/(2*
(a*d - b*c)) - (b*x*(2*A*d - 3*B*d*n))/(a*d - b*c))/(x^2*(2*a*d^3*g*i^3 - 2
*b*c*d^2*g*i^3) + x*(4*a*c*d^2*g*i^3 - 4*b*c^2*d*g*i^3) - 2*b*c^3*g*i^3 + 2
*a*c^2*d*g*i^3) - (B*b^2*log(e*((a + b*x)/(c + d*x))^n)^2)/(2*g*i^3*n*(a*d
- b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (B*b^2*log(e*((a + b*x)/(c + d*x)
)^n)*((c*g*i^3*n*(a*d - b*c))/(2*b) - (g*i^3*n*(a*d - b*c)*(a*d - 2*b*c))/(
2*b^2) + (d*g*i^3*n*x*(a*d - b*c))/b))/(g*i^3*n*(a*d - b*c)*(a^2*d^2 + b^2*
c^2 - 2*a*b*c*d)*(c^2*g*i^3 + d^2*g*i^3*x^2 + 2*c*d*g*i^3*x))
```

3.156 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)^3}\,dx$

Optimal. Leaf size=381

$$\frac{Bd^3n(a+bx)^2}{4(bc-ad)^4g^2i^3(c+dx)^2}-\frac{3bBd^2n(a+bx)}{(bc-ad)^4g^2i^3(c+dx)}-\frac{b^3Bn(c+dx)}{(bc-ad)^4g^2i^3(a+bx)}-\frac{d^3(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{2(bc-ad)^4g^2i^3(c+dx)^2}$$

```
[Out] 1/4*B*d^3*n*(b*x+a)^2/(-a*d+b*c)^4/g^2/i^3/(d*x+c)^2-3*b*B*d^2*n*(b*x+a)/(-
a*d+b*c)^4/g^2/i^3/(d*x+c)-b^3*B*n*(d*x+c)/(-a*d+b*c)^4/g^2/i^3/(b*x+a)-1/2
*d^3*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^2/i^3/(d*x+c)
^2+3*b*d^2*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^2/i^3/(d*
x+c)-b^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^2/i^3/(b*x+
a)-3*b^2*d*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/(-a*d+b*c)^4
/g^2/i^3+3/2*b^2*B*d*n*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^4/g^2/i^3
```

Rubi [A]
time = 0.18, antiderivative size = 381, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 45, 2372, 2338}

$$-\frac{b^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{3b^2d\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(bc-ad)^4}-\frac{d^3(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^2i^3(c+dx)^2(bc-ad)^4}+\frac{3bd^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(c+dx)(bc-ad)^4}-\frac{b^3Bn(c+dx)}{g^2i^3(a+bx)(bc-ad)^4}+\frac{3b^2Bdn\log^2\left(\frac{a+bx}{c+dx}\right)}{2g^2i^3(bc-ad)^4}+\frac{Bd^3n(a+bx)^2}{4g^2i^3(c+dx)^2(bc-ad)^4}-\frac{3bBd^2n(a+bx)}{g^2i^3(c+dx)(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*i*x)^3
),x]
```

```
[Out] (B*d^3*n*(a + b*x)^2)/(4*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (3*b*B*d^2*n*
(a + b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*B*n*(c + d*x))/((b*c -
a*d)^4*g^2*i^3*(a + b*x)) - (d^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) + (3*b*d^2*(a + b*x)*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*
(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^2*i^3*(a
 + b*x)) - (3*b^2*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c
 + d*x)])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B*d*n*Log[(a + b*x)/(c + d*x)]^2
)/(2*(b*c - a*d)^4*g^2*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(156c+156dx)^3(ag+bgx)^2}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc-ad)^3g^2(a+bx)^2} - \frac{b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1265472(bc-ad)^4g^2(a+bx)} + \cdots\right.$$

$$= -\frac{(b^3d)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{1265472(bc-ad)^4g^2} + \frac{(b^2d^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{1265472(bc-ad)^4g^2} + \cdots$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7592832(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7592832(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7592832(bc-ad)^2g^2(c+dx)^2} - \cdots$$

$$= -\frac{b^2Bn}{3796416(bc-ad)^3g^2(a+bx)} + \frac{Bdn}{15185664(bc-ad)^2g^2(c+dx)^2} + \cdots$$

$$= -\frac{b^2Bn}{3796416(bc-ad)^3g^2(a+bx)} + \frac{Bdn}{15185664(bc-ad)^2g^2(c+dx)^2} + \cdots$$

$$= -\frac{b^2Bn}{3796416(bc-ad)^3g^2(a+bx)} + \frac{Bdn}{15185664(bc-ad)^2g^2(c+dx)^2} + \cdots$$

<u>Mathematica</u> **[C]** Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.49, size = 477, normalized size = 1.25

$$\frac{-\frac{4b^3Bcn}{a+bx} + \frac{4ab^2Bdn}{a+bx} + \frac{Bd(bc-ad)^2n}{(c+dx)^2} + \frac{8b^2Bcdn}{c+dx} - \frac{8abBd^2n}{c+dx} + \frac{2bBd(bc-ad)n}{c+dx} + 6b^2Bdn\log(a+bx) - \frac{4b^2(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx} - \frac{2d(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(c+dx)^2} - \frac{8bd(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{c+dx} - 12b^2d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) - 6b^2Bdn\log(c+dx) + 12b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx) + 6b^2Bdn\left(\log(a+bx)\left(\log(a+bx) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right) - 6b^2Bdn\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right) - \log(c+dx)\right)\log(c+dx) + 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^4g^2i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*
i*x)^3),x]
```

```
[Out] ((-4*b^3*B*c*n)/(a + b*x) + (4*a*b^2*B*d*n)/(a + b*x) + (B*d*(b*c - a*d)^2*
n)/(c + d*x)^2 + (8*b^2*B*c*d*n)/(c + d*x) - (8*a*b*B*d^2*n)/(c + d*x) + (2
*b*B*d*(b*c - a*d)*n)/(c + d*x) + 6*b^2*B*d*n*Log[a + b*x] - (4*b^2*(b*c -
a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) - (2*d*(b*c - a*d)^2
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x)^2 - (8*b*d*(b*c - a*d)*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) - 12*b^2*d*Log[a + b*x]*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*b^2*B*d*n*Log[c + d*x] + 12*b^2*d*
```

```
(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 6*b^2*B*d*n*(Log[a +
b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)]) - 6*b^2*B*d*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
/(4*(b*c - a*d)^4*g^2*i^3)
```

Maple [F]
time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{\left(bgx+ag\right)^{2}\left(dix+ci\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1661 vs. 2(355) = 710.
time = 0.55, size = 1661, normalized size = 4.36

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B*(6*b^2*d*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2
*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) - 6*b^2*d*log(d*x + c)/((I*b^4*c^4
 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2
) + (6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d
^2)*x)/((I*b^4*c^3*d^2 - 3*I*a*b^3*c^2*d^3 + 3*I*a^2*b^2*c*d^4 - I*a^3*b*d^
5)*g^2*x^3 + (2*I*b^4*c^4*d - 5*I*a*b^3*c^3*d^2 + 3*I*a^2*b^2*c^2*d^3 + I*a
^3*b*c*d^4 - I*a^4*d^5)*g^2*x^2 + (I*b^4*c^5 - I*a*b^3*c^4*d - 3*I*a^2*b^2*
c^3*d^2 + 5*I*a^3*b*c^2*d^3 - 2*I*a^4*c*d^4)*g^2*x + (I*a*b^3*c^5 - 3*I*a^2
*b^2*c^4*d + 3*I*a^3*b*c^3*d^2 - I*a^4*c^2*d^3)*g^2))*log((b*x/(d*x + c) +
a/(d*x + c))^n*e) + 1/4*(-4*I*b^3*c^3 + 15*I*a*b^2*c^2*d - 12*I*a^2*b*c*d^2
 + I*a^3*d^3 - 6*(-I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 - 6*(-I*b^3*d^3*x^3 - I*a
*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2
*c*d^2)*x)*log(b*x + a)^2 - 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^3*c
*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(d*x + c)^
2 - 3*(-I*b^3*c^2*d - 2*I*a*b^2*c*d^2 + 3*I*a^2*b*d^3)*x - 6*(-I*b^3*d^3*x^
3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*
I*a*b^2*c*d^2)*x)*log(b*x + a) - 6*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^
3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x + 2*(I*b^3*d
```

```
^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d +
 2*I*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c))*B*n/(a*b^4*c^6*g^2 - 4*a^2
*b^3*c^5*d*g^2 + 6*a^3*b^2*c^4*d^2*g^2 - 4*a^4*b*c^3*d^3*g^2 + a^5*c^2*d^4*
g^2 + (b^5*c^4*d^2*g^2 - 4*a*b^4*c^3*d^3*g^2 + 6*a^2*b^3*c^2*d^4*g^2 - 4*a^
3*b^2*c*d^5*g^2 + a^4*b*d^6*g^2)*x^3 + (2*b^5*c^5*d*g^2 - 7*a*b^4*c^4*d^2*g
^2 + 8*a^2*b^3*c^3*d^3*g^2 - 2*a^3*b^2*c^2*d^4*g^2 - 2*a^4*b*c*d^5*g^2 + a^
5*d^6*g^2)*x^2 + (b^5*c^6*g^2 - 2*a*b^4*c^5*d*g^2 - 2*a^2*b^3*c^4*d^2*g^2 +
 8*a^3*b^2*c^3*d^3*g^2 - 7*a^4*b*c^2*d^4*g^2 + 2*a^5*c*d^5*g^2)*x) + 1/2*A*
(6*b^2*d*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 -
 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) - 6*b^2*d*log(d*x + c)/((I*b^4*c^4 - 4*I
*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) + (6
*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)
/((I*b^4*c^3*d^2 - 3*I*a*b^3*c^2*d^3 + 3*I*a^2*b^2*c*d^4 - I*a^3*b*d^5)*g^2
*x^3 + (2*I*b^4*c^4*d - 5*I*a*b^3*c^3*d^2 + 3*I*a^2*b^2*c^2*d^3 + I*a^3*b*c
*d^4 - I*a^4*d^5)*g^2*x^2 + (I*b^4*c^5 - I*a*b^3*c^4*d - 3*I*a^2*b^2*c^3*d^
2 + 5*I*a^3*b*c^2*d^3 - 2*I*a^4*c*d^4)*g^2*x + (I*a*b^3*c^5 - 3*I*a^2*b^2*c
^4*d + 3*I*a^3*b*c^3*d^2 - I*a^4*c^2*d^3)*g^2))
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 845 vs. $2(355) = 710$.
time = 0.48, size = 845, normalized size = 2.22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] -1/4*(4*(I*A + I*B)*b^3*c^3 + 6*(I*A + I*B)*a*b^2*c^2*d + 12*(-I*A - I*B)*a
^2*b*c*d^2 + 2*(I*A + I*B)*a^3*d^3 + 6*(2*(I*A + I*B)*b^3*c*d^2 + 2*(-I*A -
 I*B)*a*b^2*d^3 + (-I*B*b^3*c*d^2 + I*B*a*b^2*d^3)*n)*x^2 + 6*(I*B*b^3*d^3*
n*x^3 + I*B*a*b^2*c^2*d*n + (2*I*B*b^3*c*d^2 + I*B*a*b^2*d^3)*n*x^2 + (I*B*
b^3*c^2*d + 2*I*B*a*b^2*c*d^2)*n*x)*log((b*x + a)/(d*x + c))^2 - (-4*I*B*b^
3*c^3 + 15*I*B*a*b^2*c^2*d - 12*I*B*a^2*b*c*d^2 + I*B*a^3*d^3)*n + 3*(6*(I*
A + I*B)*b^3*c^2*d + 4*(-I*A - I*B)*a*b^2*c*d^2 + 2*(-I*A - I*B)*a^2*b*d^3
+ (-I*B*b^3*c^2*d - 2*I*B*a*b^2*c*d^2 + 3*I*B*a^2*b*d^3)*n)*x + 2*(6*(I*A +
 I*B)*a*b^2*c^2*d + 3*(-I*B*b^3*d^3*n + 2*(I*A + I*B)*b^3*d^3)*x^3 + 3*(-3*
I*B*a*b^2*d^3*n + 4*(I*A + I*B)*b^3*c*d^2 + 2*(I*A + I*B)*a*b^2*d^3)*x^2 +
(2*I*B*b^3*c^3 - 6*I*B*a^2*b*c*d^2 + I*B*a^3*d^3)*n + 3*(2*(I*A + I*B)*b^3*
c^2*d + 4*(I*A + I*B)*a*b^2*c*d^2 + (2*I*B*b^3*c^2*d - 4*I*B*a*b^2*c*d^2 -
I*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))/((b^5*c^4*d^2 - 4*a*b^4*c^3*
d^3 + 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c*d^5 + a^4*b*d^6)*g^2*x^3 + (2*b^5*c^5
*d - 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3 - 2*a^3*b^2*c^2*d^4 - 2*a^4*b*c*d^
5 + a^5*d^6)*g^2*x^2 + (b^5*c^6 - 2*a*b^4*c^5*d - 2*a^2*b^3*c^4*d^2 + 8*a^3
*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^5)*g^2*x + (a*b^4*c^6 - 4*a^2*b^
3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d^3 + a^5*c^2*d^4)*g^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)/((b*g*x + a*g)^2*(I*d*x +
I*c)^3), x)
```

Mupad [**B**]
time = 7.53, size = 1018, normalized size = 2.67

$$\frac{\frac{4\,A\,b^2\,c^2-2\,A\,a^2\,d^2+B\,a^2\,d^2\,n+4\,B\,b^2\,c^2\,n+10\,A\,a\,b\,c\,d-11\,B\,a\,b\,c\,d\,n}{2\,(a\,d-b\,c)}+\frac{3\,x^2\,(2\,A\,b^2\,d^2-B\,b^2\,d^2\,n)}{a\,d-b\,c}+\frac{3\,x\,(2\,A\,a\,b\,d^2+6\,A\,b^2\,c\,d-3\,B\,a\,b\,d^2\,n-B\,b^2\,c\,d\,n)}{2\,(a\,d-b\,c)}}{x\,(4\,a^3\,c\,d^3\,g^2\,i^3-6\,a^2\,b\,c^2\,d^2\,g^2\,i^3+2\,b^3\,c^4\,g^2\,i^3)+x^2\,(2\,a^3\,d^4\,g^2\,i^3-6\,a\,b^2\,c^2\,d^2\,g^2\,i^3+4\,b^3\,c^3\,d\,g^2\,i^3)+x^3\,(2\,a^2\,b\,d^4\,g^2\,i^3-4\,a\,b^2\,c\,d^3\,g^2\,i^3+2\,b^3\,c^2\,d^2\,g^2\,i^3)+2\,a^3\,c^2\,d^2\,g^2\,i^3+2\,a\,b^2\,c^4\,g^2\,i^3-4\,a^2\,b\,c^3\,d\,g^2\,i^3}-\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,\left(\frac{\frac{B\,(a\,d+2\,b\,c)}{2\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}+\frac{3\,B\,b\,d\,x}{2\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}}{x\,(b\,c^2\,g^2\,i^3+2\,a\,d\,c\,g^2\,i^3)+x^2\,(a\,d^2\,g^2\,i^3+2\,b\,c\,d\,g^2\,i^3)+a\,c^2\,g^2\,i^3+b\,d^2\,g^2\,i^3\,x^3}-\frac{3\,B\,b^2\,d\,\left(d\,g^2\,i^3\,n\,x^2\,(a\,d-b\,c)+\frac{a\,c\,g^2\,i^3\,n\,(a\,d-b\,c)}{b}+\frac{g^2\,i^3\,n\,x\,(a\,d+b\,c)\,(a\,d-b\,c)}{b}\right)}{g^2\,i^3\,n\,{(a\,d-b\,c)}^4\,(x\,(b\,c^2\,g^2\,i^3+2\,a\,d\,c\,g^2\,i^3)+x^2\,(a\,d^2\,g^2\,i^3+2\,b\,c\,d\,g^2\,i^3)+a\,c^2\,g^2\,i^3+b\,d^2\,g^2\,i^3\,x^3)}\right)-\frac{3\,B\,b^2\,d\,{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}^2}{2\,g^2\,i^3\,n\,{(a\,d-b\,c)}^4}+\frac{b^2\,d\,\mathrm{atan}\left(\frac{b^2\,d\,(2\,A-B\,n)\,\left(\frac{a^4\,d^4\,g^2\,i^3-2\,a^3\,b\,c\,d^3\,g^2\,i^3+2\,a\,b^3\,c^3\,d\,g^2\,i^3-b^4\,c^4\,g^2\,i^3}{a^3\,d^3\,g^2\,i^3-3\,a^2\,b\,c\,d^2\,g^2\,i^3+3\,a\,b^2\,c^2\,d\,g^2\,i^3-b^3\,c^3\,g^2\,i^3}+2\,b\,d\,x\right)\,(a^3\,d^3\,g^2\,i^3-3\,a^2\,b\,c\,d^2\,g^2\,i^3+3\,a\,b^2\,c^2\,d\,g^2\,i^3-b^3\,c^3\,g^2\,i^3)\,3{}\mathrm{i}}{g^2\,i^3\,(6\,A\,b^2\,d-3\,B\,b^2\,d\,n)\,{(a\,d-b\,c)}^4}\right)\,(2\,A-B\,n)\,3{}\mathrm{i}}{g^2\,i^3\,{(a\,d-b\,c)}^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)^2*(c*i + d*i*x)^3
),x)
```

```
[Out] ((4*A*b^2*c^2 - 2*A*a^2*d^2 + B*a^2*d^2*n + 4*B*b^2*c^2*n + 10*A*a*b*c*d -
11*B*a*b*c*d*n)/(2*(a*d - b*c)) + (3*x^2*(2*A*b^2*d^2 - B*b^2*d^2*n))/(a*d
- b*c) + (3*x*(2*A*a*b*d^2 + 6*A*b^2*c*d - 3*B*a*b*d^2*n - B*b^2*c*d*n))/(2
*(a*d - b*c)))/(x*(2*b^3*c^4*g^2*i^3 + 4*a^3*c*d^3*g^2*i^3 - 6*a^2*b*c^2*d^
2*g^2*i^3) + x^2*(2*a^3*d^4*g^2*i^3 + 4*b^3*c^3*d*g^2*i^3 - 6*a*b^2*c^2*d^2
*g^2*i^3) + x^3*(2*b^3*c^2*d^2*g^2*i^3 + 2*a^2*b*d^4*g^2*i^3 - 4*a*b^2*c*d^
3*g^2*i^3) + 2*a^3*c^2*d^2*g^2*i^3 + 2*a*b^2*c^4*g^2*i^3 - 4*a^2*b*c^3*d*g^
2*i^3) - log(e*((a + b*x)/(c + d*x))^n)*(((B*(a*d + 2*b*c))/(2*(a^2*d^2 + b
^2*c^2 - 2*a*b*c*d)) + (3*B*b*d*x)/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)))/(x*
(b*c^2*g^2*i^3 + 2*a*c*d*g^2*i^3) + x^2*(a*d^2*g^2*i^3 + 2*b*c*d*g^2*i^3) +
 a*c^2*g^2*i^3 + b*d^2*g^2*i^3*x^3) - (3*B*b^2*d*(d*g^2*i^3*n*x^2*(a*d - b*
c) + (a*c*g^2*i^3*n*(a*d - b*c))/b + (g^2*i^3*n*x*(a*d + b*c)*(a*d - b*c))/
b))/(g^2*i^3*n*(a*d - b*c)^4*(x*(b*c^2*g^2*i^3 + 2*a*c*d*g^2*i^3) + x^2*(a*
d^2*g^2*i^3 + 2*b*c*d*g^2*i^3) + a*c^2*g^2*i^3 + b*d^2*g^2*i^3*x^3))) + (b^
```

```
2*d*atan((b^2*d*(2*A - B*n)*((a^4*d^4*g^2*i^3 - b^4*c^4*g^2*i^3 + 2*a*b^3*c
^3*d*g^2*i^3 - 2*a^3*b*c*d^3*g^2*i^3)/(a^3*d^3*g^2*i^3 - b^3*c^3*g^2*i^3 +
3*a*b^2*c^2*d*g^2*i^3 - 3*a^2*b*c*d^2*g^2*i^3) + 2*b*d*x)*(a^3*d^3*g^2*i^3
- b^3*c^3*g^2*i^3 + 3*a*b^2*c^2*d*g^2*i^3 - 3*a^2*b*c*d^2*g^2*i^3)*3i)/(g^2
*i^3*(6*A*b^2*d - 3*B*b^2*d*n)*(a*d - b*c)^4))*(2*A - B*n)*3i)/(g^2*i^3*(a*
d - b*c)^4) - (3*B*b^2*d*log(e*((a + b*x)/(c + d*x))^n)^2)/(2*g^2*i^3*n*(a*
d - b*c)^4)
```

3.157 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)^3}\,dx$

Optimal. Leaf size=483

$$-\frac{Bd^4n(a+bx)^2}{4(bc-ad)^5g^3i^3(c+dx)^2}+\frac{4bBd^3n(a+bx)}{(bc-ad)^5g^3i^3(c+dx)}+\frac{4b^3Bdn(c+dx)}{(bc-ad)^5g^3i^3(a+bx)}-\frac{b^4Bn(c+dx)^2}{4(bc-ad)^5g^3i^3(a+bx)^2}+d^4$$

```
[Out] -1/4*B*d^4*n*(b*x+a)^2/(-a*d+b*c)^5/g^3/i^3/(d*x+c)^2+4*b*B*d^3*n*(b*x+a)/(
-a*d+b*c)^5/g^3/i^3/(d*x+c)+4*b^3*B*d*n*(d*x+c)/(-a*d+b*c)^5/g^3/i^3/(b*x+a
)-1/4*b^4*B*n*(d*x+c)^2/(-a*d+b*c)^5/g^3/i^3/(b*x+a)^2+1/2*d^4*(b*x+a)^2*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^3/i^3/(d*x+c)^2-4*b*d^3*(b*x+a
)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^3/i^3/(d*x+c)+4*b^3*d*(d*x
+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^3/i^3/(b*x+a)-1/2*b^4*(d
*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^3/i^3/(b*x+a)^2+6*b^
2*d^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/(-a*d+b*c)^5/g^3/
i^3-3*b^2*B*d^2*n*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^5/g^3/i^3
```

Rubi [A]
time = 0.22, antiderivative size = 483, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 45, 2372, 2338}

$$-\frac{b^4(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b^3d(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^3(a+bx)(bc-ad)^5}+\frac{6b^2d^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^3(bc-ad)^5}+\frac{d^4(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^3(c+dx)^2(bc-ad)^5}-\frac{4bd^3(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^3(c+dx)(bc-ad)^5}-\frac{b^4Bn(c+dx)^2}{4g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b^3Bdn(c+dx)}{g^3i^3(a+bx)(bc-ad)^5}-\frac{3b^2Bd^2n\log^2\left(\frac{a+bx}{c+dx}\right)}{g^3i^3(bc-ad)^5}-\frac{Bd^4n(a+bx)^2}{4g^3i^3(c+dx)^2(bc-ad)^5}+\frac{4bBd^3n(a+bx)}{g^3i^3(c+dx)(bc-ad)^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*i*x)^3
),x]
```

```
[Out] -1/4*(B*d^4*n*(a + b*x)^2)/((b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (4*b*B*d^3
*n*(a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*B*d*n*(c + d*x))/(
(b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B*n*(c + d*x)^2)/(4*(b*c - a*d)^5*g
^3*i^3*(a + b*x)^2) + (d^4*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]))/(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(a + b*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*d*(c
 + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^3*i^3*(a +
 b*x)) - (b^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c -
 a*d)^5*g^3*i^3*(a + b*x)^2) + (6*b^2*d^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^5*g^3*i^3) - (3*b^2*B*d^2*n*Lo
g[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^5*g^3*i^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(157c+157dx)^3(ag+bgx)^3}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^3g^3(a+bx)^3} - \frac{3b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^4g^3(a+bx)^2} + \right.$$

$$= \frac{(6b^3d^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{3869893(bc-ad)^5g^3} - \frac{(6b^2d^3)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{3869893(bc-ad)^5g^3} - \frac{(3b^3}{3}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^4g^3(a+bx)} + \frac{}{77}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^4g^3(a+bx)} + \frac{}{77}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^4g^3(a+bx)} + \frac{}{77}$$

$$= -\frac{b^2Bn}{15479572(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bdn}{7739786(bc-ad)^4g^3(a+bx)} - \frac{}{1}$$

$$= -\frac{b^2Bn}{15479572(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bdn}{7739786(bc-ad)^4g^3(a+bx)} - \frac{}{1}$$

$$= -\frac{b^2Bn}{15479572(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bdn}{7739786(bc-ad)^4g^3(a+bx)} - \frac{}{1}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.81, size = 561, normalized size = 1.16

$$-\frac{\frac{b^2B(bc-ad)^2n}{(a+bx)^2} - \frac{12b^3Bcdn}{a+bx} + \frac{12ab^2Bd^2n}{a+bx} - \frac{2b^2Bd(bc-ad)n}{a+bx} + \frac{Bd^2(bc-ad)^2n}{(c+dx)^2} + \frac{12b^2Bcd^2n}{c+dx} - \frac{12abBd^3n}{c+dx} + \frac{2bBd^2(bc-ad)n}{c+dx} + \frac{2b^2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)^2} - \frac{12b^2d(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx} - \frac{2d^2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(c+dx)^2} - \frac{12bd^2(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{c+dx} - 24b^2d^2\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) + 24b^2d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx) + 12b^2Bd^2n\left(\log(a+bx)\left(\log(a+bx) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right) - 2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right) - 12b^2Bd^2n\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right) - \log(c+dx)\right)\log(c+dx) + 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)}{4(bc-ad)^5g^3i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*
i*x)^3),x]
```

```
[Out] -1/4*((b^2*B*(b*c - a*d)^2*n)/(a + b*x)^2 - (12*b^3*B*c*d*n)/(a + b*x) + (1
2*a*b^2*B*d^2*n)/(a + b*x) - (2*b^2*B*d*(b*c - a*d)*n)/(a + b*x) + (B*d^2*(
b*c - a*d)^2*n)/(c + d*x)^2 + (12*b^2*B*c*d^2*n)/(c + d*x) - (12*a*b*B*d^3*
n)/(c + d*x) + (2*b*B*d^2*(b*c - a*d)*n)/(c + d*x) + (2*b^2*(b*c - a*d)^2*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 - (12*b^2*d*(b*c - a*d)*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) - (2*d^2*(b*c - a*d)^2*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x)^2 - (12*b*d^2*(b*c - a*d)*(
```

```
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) - 24*b^2*d^2*Log[a + b*x]*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 24*b^2*d^2*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])*Log[c + d*x] + 12*b^2*B*d^2*n*(Log[a + b*x]*(Log[a + b*x] -
 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a
*d)]) - 12*b^2*B*d^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x]
)*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^5*g
^3*i^3)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{\left(bgx+ag\right)^{3}\left(dix+ci\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2300 vs. 2(450) = 900.
time = 0.55, size = 2300, normalized size = 4.76

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B*(12*b^2*d^2*log(b*x + a)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^
3*c^3*d^2 + 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) - 12*b
^2*d^2*log(d*x + c)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 +
 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) + (12*b^3*d^3*x^3
 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^
2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((-I*b^6*c^4*d^2
+ 4*I*a*b^5*c^3*d^3 - 6*I*a^2*b^4*c^2*d^4 + 4*I*a^3*b^3*c*d^5 - I*a^4*b^2*d
^6)*g^3*x^4 + 2*(-I*b^6*c^5*d + 3*I*a*b^5*c^4*d^2 - 2*I*a^2*b^4*c^3*d^3 - 2
*I*a^3*b^3*c^2*d^4 + 3*I*a^4*b^2*c*d^5 - I*a^5*b*d^6)*g^3*x^3 + (-I*b^6*c^6
 + 9*I*a^2*b^4*c^4*d^2 - 16*I*a^3*b^3*c^3*d^3 + 9*I*a^4*b^2*c^2*d^4 - I*a^6
*d^6)*g^3*x^2 + 2*(-I*a*b^5*c^6 + 3*I*a^2*b^4*c^5*d - 2*I*a^3*b^3*c^4*d^2 -
 2*I*a^4*b^2*c^3*d^3 + 3*I*a^5*b*c^2*d^4 - I*a^6*c*d^5)*g^3*x + (-I*a^2*b^4
*c^6 + 4*I*a^3*b^3*c^5*d - 6*I*a^4*b^2*c^4*d^2 + 4*I*a^5*b*c^3*d^3 - I*a^6*
c^2*d^4)*g^3))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*(I*b^4*c^4 - 16
*I*a*b^3*c^3*d + 30*I*a^2*b^2*c^2*d^2 - 16*I*a^3*b*c*d^3 + I*a^4*d^4 - 12*(
I*b^4*c^2*d^2 - 2*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)*x^2 - 12*(-I*b^4*d^4*x^4 -
```

```
 I*a^2*b^2*c^2*d^2 + 2*(-I*b^4*c*d^3 - I*a*b^3*d^4)*x^3 + (-I*b^4*c^2*d^2 -
 4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 + 2*(-I*a*b^3*c^2*d^2 - I*a^2*b^2*c*d
^3)*x)*log(b*x + a)^2 - 24*(I*b^4*d^4*x^4 + I*a^2*b^2*c^2*d^2 + 2*(I*b^4*c*
d^3 + I*a*b^3*d^4)*x^3 + (I*b^4*c^2*d^2 + 4*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)*
x^2 + 2*(I*a*b^3*c^2*d^2 + I*a^2*b^2*c*d^3)*x)*log(b*x + a)*log(d*x + c) -
12*(-I*b^4*d^4*x^4 - I*a^2*b^2*c^2*d^2 + 2*(-I*b^4*c*d^3 - I*a*b^3*d^4)*x^3
 + (-I*b^4*c^2*d^2 - 4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 + 2*(-I*a*b^3*c^2
*d^2 - I*a^2*b^2*c*d^3)*x)*log(d*x + c)^2 - 12*(I*b^4*c^3*d - I*a*b^3*c^2*d
^2 - I*a^2*b^2*c*d^3 + I*a^3*b*d^4)*x)*B*n/(a^2*b^5*c^7*g^3 - 5*a^3*b^4*c^6
*d*g^3 + 10*a^4*b^3*c^5*d^2*g^3 - 10*a^5*b^2*c^4*d^3*g^3 + 5*a^6*b*c^3*d^4*
g^3 - a^7*c^2*d^5*g^3 + (b^7*c^5*d^2*g^3 - 5*a*b^6*c^4*d^3*g^3 + 10*a^2*b^5
*c^3*d^4*g^3 - 10*a^3*b^4*c^2*d^5*g^3 + 5*a^4*b^3*c*d^6*g^3 - a^5*b^2*d^7*g
^3)*x^4 + 2*(b^7*c^6*d*g^3 - 4*a*b^6*c^5*d^2*g^3 + 5*a^2*b^5*c^4*d^3*g^3 -
5*a^4*b^3*c^2*d^5*g^3 + 4*a^5*b^2*c*d^6*g^3 - a^6*b*d^7*g^3)*x^3 + (b^7*c^7
*g^3 - a*b^6*c^6*d*g^3 - 9*a^2*b^5*c^5*d^2*g^3 + 25*a^3*b^4*c^4*d^3*g^3 - 2
5*a^4*b^3*c^3*d^4*g^3 + 9*a^5*b^2*c^2*d^5*g^3 + a^6*b*c*d^6*g^3 - a^7*d^7*g
^3)*x^2 + 2*(a*b^6*c^7*g^3 - 4*a^2*b^5*c^6*d*g^3 + 5*a^3*b^4*c^5*d^2*g^3 -
5*a^5*b^2*c^3*d^4*g^3 + 4*a^6*b*c^2*d^5*g^3 - a^7*c*d^6*g^3)*x) + 1/2*A*(12
*b^2*d^2*log(b*x + a)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2
 + 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) - 12*b^2*d^2*lo
g(d*x + c)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 + 10*I*a^3
*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) + (12*b^3*d^3*x^3 - b^3*c^
3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^
2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((-I*b^6*c^4*d^2 + 4*I*a*b
^5*c^3*d^3 - 6*I*a^2*b^4*c^2*d^4 + 4*I*a^3*b^3*c*d^5 - I*a^4*b^2*d^6)*g^3*x
^4 + 2*(-I*b^6*c^5*d + 3*I*a*b^5*c^4*d^2 - 2*I*a^2*b^4*c^3*d^3 - 2*I*a^3*b^
3*c^2*d^4 + 3*I*a^4*b^2*c*d^5 - I*a^5*b*d^6)*g^3*x^3 + (-I*b^6*c^6 + 9*I*a^
2*b^4*c^4*d^2 - 16*I*a^3*b^3*c^3*d^3 + 9*I*a^4*b^2*c^2*d^4 - I*a^6*d^6)*g^3
*x^2 + 2*(-I*a*b^5*c^6 + 3*I*a^2*b^4*c^5*d - 2*I*a^3*b^3*c^4*d^2 - 2*I*a^4*
b^2*c^3*d^3 + 3*I*a^5*b*c^2*d^4 - I*a^6*c*d^5)*g^3*x + (-I*a^2*b^4*c^6 + 4*
I*a^3*b^3*c^5*d - 6*I*a^4*b^2*c^4*d^2 + 4*I*a^5*b*c^3*d^3 - I*a^6*c^2*d^4)*
g^3))
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1265 vs. $2(450) = 900$.
time = 0.41, size = 1265, normalized size = 2.62

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] 1/4*(2*(-I*A - I*B)*b^4*c^4 + 16*(I*A + I*B)*a*b^3*c^3*d + 16*(-I*A - I*B)*
a^3*b*c*d^3 + 2*(I*A + I*B)*a^4*d^4 + 24*((I*A + I*B)*b^4*c*d^3 + (-I*A - I
```

```
*B)*a*b^3*d^4)*x^3 + 12*(3*(I*A + I*B)*b^4*c^2*d^2 + 3*(-I*A - I*B)*a^2*b^2
*d^4 + (I*B*b^4*c^2*d^2 - 2*I*B*a*b^3*c*d^3 + I*B*a^2*b^2*d^4)*n)*x^2 + 12*
(I*B*b^4*d^4*n*x^4 + I*B*a^2*b^2*c^2*d^2*n + 2*(I*B*b^4*c*d^3 + I*B*a*b^3*d
^4)*n*x^3 + (I*B*b^4*c^2*d^2 + 4*I*B*a*b^3*c*d^3 + I*B*a^2*b^2*d^4)*n*x^2 +
 2*(I*B*a*b^3*c^2*d^2 + I*B*a^2*b^2*c*d^3)*n*x)*log((b*x + a)/(d*x + c))^2
- (I*B*b^4*c^4 - 16*I*B*a*b^3*c^3*d + 30*I*B*a^2*b^2*c^2*d^2 - 16*I*B*a^3*b
*c*d^3 + I*B*a^4*d^4)*n + 4*(2*(I*A + I*B)*b^4*c^3*d + 12*(I*A + I*B)*a*b^3
*c^2*d^2 + 12*(-I*A - I*B)*a^2*b^2*c*d^3 + 2*(-I*A - I*B)*a^3*b*d^4 + 3*(I*
B*b^4*c^3*d - I*B*a*b^3*c^2*d^2 - I*B*a^2*b^2*c*d^3 + I*B*a^3*b*d^4)*n)*x +
 2*(12*(I*A + I*B)*b^4*d^4*x^4 + 12*(I*A + I*B)*a^2*b^2*c^2*d^2 + 12*(2*(I*
A + I*B)*b^4*c*d^3 + 2*(I*A + I*B)*a*b^3*d^4 + (I*B*b^4*c*d^3 - I*B*a*b^3*d
^4)*n)*x^3 + 6*(2*(I*A + I*B)*b^4*c^2*d^2 + 8*(I*A + I*B)*a*b^3*c*d^3 + 2*(
I*A + I*B)*a^2*b^2*d^4 + 3*(I*B*b^4*c^2*d^2 - I*B*a^2*b^2*d^4)*n)*x^2 + (-I
*B*b^4*c^4 + 8*I*B*a*b^3*c^3*d - 8*I*B*a^3*b*c*d^3 + I*B*a^4*d^4)*n + 4*(6*
(I*A + I*B)*a*b^3*c^2*d^2 + 6*(I*A + I*B)*a^2*b^2*c*d^3 + (I*B*b^4*c^3*d +
6*I*B*a*b^3*c^2*d^2 - 6*I*B*a^2*b^2*c*d^3 - I*B*a^3*b*d^4)*n)*x)*log((b*x +
 a)/(d*x + c)))/((b^7*c^5*d^2 - 5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a
^3*b^4*c^2*d^5 + 5*a^4*b^3*c*d^6 - a^5*b^2*d^7)*g^3*x^4 + 2*(b^7*c^6*d - 4*
a*b^6*c^5*d^2 + 5*a^2*b^5*c^4*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a
^6*b*d^7)*g^3*x^3 + (b^7*c^7 - a*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4
*c^4*d^3 - 25*a^4*b^3*c^3*d^4 + 9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*
g^3*x^2 + 2*(a*b^6*c^7 - 4*a^2*b^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2*c^
3*d^4 + 4*a^6*b*c^2*d^5 - a^7*c*d^6)*g^3*x + (a^2*b^5*c^7 - 5*a^3*b^4*c^6*d
 + 10*a^4*b^3*c^5*d^2 - 10*a^5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c^2*d^5)
*g^3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)/((b*g*x + a*g)^3*(I*d*x +
I*c)^3), x)
```

Mupad [B]
time = 7.93, size = 1341, normalized size = 2.78

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)^3*(c*i + d*i*x)^3
),x)
```

```
[Out] ((2*x*(2*A*a^2*b*d^3 + 2*A*b^3*c^2*d + 14*A*a*b^2*c*d^2 - 3*B*a^2*b*d^3*n +
 3*B*b^3*c^2*d*n))/(a*d - b*c) - (2*A*a^3*d^3 + 2*A*b^3*c^3 - B*a^3*d^3*n +
 B*b^3*c^3*n - 14*A*a*b^2*c^2*d - 14*A*a^2*b*c*d^2 - 15*B*a*b^2*c^2*d*n + 1
5*B*a^2*b*c*d^2*n)/(2*(a*d - b*c)) + (6*x^2*(3*A*a*b^2*d^3 + 3*A*b^3*c*d^2
- B*a*b^2*d^3*n + B*b^3*c*d^2*n))/(a*d - b*c) + (12*A*b^3*d^3*x^3)/(a*d - b
*c))/(x^4*(2*a^3*b^2*d^5*g^3*i^3 - 2*b^5*c^3*d^2*g^3*i^3 + 6*a*b^4*c^2*d^3*
g^3*i^3 - 6*a^2*b^3*c*d^4*g^3*i^3) - x*(4*a*b^4*c^5*g^3*i^3 - 4*a^5*c*d^4*g
^3*i^3 - 8*a^2*b^3*c^4*d*g^3*i^3 + 8*a^4*b*c^2*d^3*g^3*i^3) + x^3*(4*a^4*b*
d^5*g^3*i^3 - 4*b^5*c^4*d*g^3*i^3 + 8*a*b^4*c^3*d^2*g^3*i^3 - 8*a^3*b^2*c*d
^4*g^3*i^3) + x^2*(2*a^5*d^5*g^3*i^3 - 2*b^5*c^5*g^3*i^3 - 2*a*b^4*c^4*d*g^
3*i^3 + 2*a^4*b*c*d^4*g^3*i^3 + 16*a^2*b^3*c^3*d^2*g^3*i^3 - 16*a^3*b^2*c^2
*d^3*g^3*i^3) - 2*a^2*b^3*c^5*g^3*i^3 + 2*a^5*c^2*d^3*g^3*i^3 + 6*a^3*b^2*c
^4*d*g^3*i^3 - 6*a^4*b*c^3*d^2*g^3*i^3) + (log(e*((a + b*x)/(c + d*x))^n)*(
x*((3*B*b*d*(a*d + b*c)^2)/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2 - (B*b*d)/(a^2
*d^2 + b^2*c^2 - 2*a*b*c*d) + (6*B*a*b^2*c*d^2)/(a^2*d^2 + b^2*c^2 - 2*a*b*
c*d)^2) - (B*(a*d + b*c))/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (6*B*b^3*d^
3*x^3)/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2 + (9*B*b^2*d^2*x^2*(a*d + b*c))/(a
^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2 + (3*B*a*b*c*d*(a*d + b*c))/(a^2*d^2 + b^2*
c^2 - 2*a*b*c*d)^2))/(x*(2*a*b*c^2*g^3*i^3 + 2*a^2*c*d*g^3*i^3) + x^3*(2*a*
b*d^2*g^3*i^3 + 2*b^2*c*d*g^3*i^3) + x^2*(a^2*d^2*g^3*i^3 + b^2*c^2*g^3*i^3
 + 4*a*b*c*d*g^3*i^3) + a^2*c^2*g^3*i^3 + b^2*d^2*g^3*i^3*x^4) + (A*b^2*d^2
*atan(((a^5*d^5*g^3*i^3 + b^5*c^5*g^3*i^3 - 3*a*b^4*c^4*d*g^3*i^3 - 3*a^4*b
*c*d^4*g^3*i^3 + 2*a^2*b^3*c^3*d^2*g^3*i^3 + 2*a^3*b^2*c^2*d^3*g^3*i^3)*1i)
/(g^3*i^3*(a*d - b*c)^5) + (b*d*x*(a^4*d^4*g^3*i^3 + b^4*c^4*g^3*i^3 - 4*a*
b^3*c^3*d*g^3*i^3 - 4*a^3*b*c*d^3*g^3*i^3 + 6*a^2*b^2*c^2*d^2*g^3*i^3)*2i)/
(g^3*i^3*(a*d - b*c)^5))*12i)/(g^3*i^3*(a*d - b*c)^5) - (3*B*b^2*d^2*log(e*
((a + b*x)/(c + d*x))^n)^2)/(g^3*i^3*n*(a*d - b*c)^5)
```

3.158 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)^3}\,dx$

Optimal. Leaf size=587

$$\frac{Bd^5n(a+bx)^2}{4(bc-ad)^6g^4i^3(c+dx)^2}-\frac{5bBd^4n(a+bx)}{(bc-ad)^6g^4i^3(c+dx)}-\frac{10b^3Bd^2n(c+dx)}{(bc-ad)^6g^4i^3(a+bx)}+\frac{5b^4Bdn(c+dx)^2}{4(bc-ad)^6g^4i^3(a+bx)^2}-\frac{\quad}{9(bc}$$

```
[Out] 1/4*B*d^5*n*(b*x+a)^2/(-a*d+b*c)^6/g^4/i^3/(d*x+c)^2-5*b*B*d^4*n*(b*x+a)/(-
a*d+b*c)^6/g^4/i^3/(d*x+c)-10*b^3*B*d^2*n*(d*x+c)/(-a*d+b*c)^6/g^4/i^3/(b*x
+a)+5/4*b^4*B*d*n*(d*x+c)^2/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^2-1/9*b^5*B*n*(d*x
+c)^3/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^3-1/2*d^5*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(
d*x+c))^n))/(-a*d+b*c)^6/g^4/i^3/(d*x+c)^2+5*b*d^4*(b*x+a)*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))/(-a*d+b*c)^6/g^4/i^3/(d*x+c)-10*b^3*d^2*(d*x+c)*(A+B*ln(e*(
(b*x+a)/(d*x+c))^n))/(-a*d+b*c)^6/g^4/i^3/(b*x+a)+5/2*b^4*d*(d*x+c)^2*(A+B*
ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^2-1/3*b^5*(d*x+c)^3
*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^3-10*b^2*d^3*
(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/(-a*d+b*c)^6/g^4/i^3+5*
b^2*B*d^3*n*ln((b*x+a)/(d*x+c))^2/(-a*d+b*c)^6/g^4/i^3
```

Rubi [A]

time = 0.26, antiderivative size = 587, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.140$, Rules used = {2561, 45, 2372, 12, 14, 2338}

$$-\frac{b^5(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4i^3(a+bx)^3(bc-ad)^6}+\frac{5b^4d(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^4i^3(a+bx)^2(bc-ad)^6}-\frac{10b^3d^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^3(a+bx)(bc-ad)^6}-\frac{10b^2d^3\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^3(bc-ad)^6}-\frac{d^5(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^4i^3(c+dx)^2(bc-ad)^6}+\frac{5bd^4(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^3(c+dx)(bc-ad)^6}-\frac{b^5Bn(c+dx)^3}{9g^4i^3(a+bx)^3(bc-ad)^6}+\frac{5b^4Bdn(c+dx)^2}{4g^4i^3(a+bx)^2(bc-ad)^6}-\frac{10b^3Bd^2n(c+dx)}{g^4i^3(a+bx)(bc-ad)^6}+\frac{5b^2Bd^3n\log^2\left(\frac{a+bx}{c+dx}\right)}{g^4i^3(bc-ad)^6}+\frac{Bd^5n(a+bx)^2}{4g^4i^3(c+dx)^2(bc-ad)^6}-\frac{5bBd^4n(a+bx)}{g^4i^3(c+dx)(bc-ad)^6}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*i*x)^3
),x]
```

```
[Out] (B*d^5*n*(a + b*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (5*b*B*d^4*n*
(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*B*d^2*n*(c + d*x))/(
(b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*n*(c + d*x)^2)/(4*(b*c - a*d)
^6*g^4*i^3*(a + b*x)^2) - (b^5*B*n*(c + d*x)^3)/(9*(b*c - a*d)^6*g^4*i^3*(a
 + b*x)^3) - (d^5*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b
*c - a*d)^6*g^4*i^3*(c + d*x)^2) + (5*b*d^4*(a + b*x)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*d^2*(c + d*x
)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^6*g^4*i^3*(a + b*x))
 + (5*b^4*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a
*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(3*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (10*b^2*d^3*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^6*g^4*i^3
) + (5*b^2*B*d^3*n*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2372

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Dist[a +
b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; F
reeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1]
 && EqQ[m, -1])
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(158c+158dx)^3(ag+bgx)^4}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3944312(bc-ad)^3g^4(a+bx)^4} - \frac{3b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3944312(bc-ad)^4g^4(a+bx)^3} + \right.$$

$$= -\frac{(5b^3d^3)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{1972156(bc-ad)^6g^4} + \frac{(5b^2d^4)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{1972156(bc-ad)^6g^4} + (3b^3$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11832936(bc-ad)^3g^4(a+bx)^3} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7888624(bc-ad)^4g^4(a+bx)^2} -$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11832936(bc-ad)^3g^4(a+bx)^3} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7888624(bc-ad)^4g^4(a+bx)^2} -$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11832936(bc-ad)^3g^4(a+bx)^3} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7888624(bc-ad)^4g^4(a+bx)^2} -$$

$$= -\frac{b^2Bn}{35498808(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bdn}{47331744(bc-ad)^4g^4(a+bx)^2} -$$

$$= -\frac{b^2Bn}{35498808(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bdn}{47331744(bc-ad)^4g^4(a+bx)^2} -$$

$$= -\frac{b^2Bn}{35498808(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bdn}{47331744(bc-ad)^4g^4(a+bx)^2} -$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 1.19, size = 671, normalized size = 1.14

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*
i*x)^3),x]
```

```
[Out] -1/36*((4*b^2*B*(b*c - a*d)^3*n)/(a + b*x)^3 - (33*b^2*B*d*(b*c - a*d)^2*n)
/(a + b*x)^2 + (216*b^3*B*c*d^2*n)/(a + b*x) - (216*a*b^2*B*d^3*n)/(a + b*x
) + (66*b^2*B*d^2*(b*c - a*d)*n)/(a + b*x) - (9*B*d^3*(b*c - a*d)^2*n)/(c +
 d*x)^2 - (144*b^2*B*c*d^3*n)/(c + d*x) + (144*a*b*B*d^4*n)/(c + d*x) - (18
*b*B*d^3*(b*c - a*d)*n)/(c + d*x) + 120*b^2*B*d^3*n*Log[a + b*x] + (12*b^2*
(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^3 - (54*b^2
*d*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (216
```

```
*b^2*d^2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + (1
8*d^3*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x)^2 + (
144*b*d^3*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) + 3
60*b^2*d^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 120*b^2*B*
d^3*n*Log[c + d*x] - 360*b^2*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log
[c + d*x] - 180*b^2*B*d^3*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x
))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 180*b^2*B*
d^3*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^6*g^4*i^3)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{\left(bgx+ag\right)^{4}\left(dix+ci\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3673 vs. 2(545) = 1090.
time = 1.11, size = 3673, normalized size = 6.26

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/6*B*(60*b^2*d^3*log(b*x + a)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4
*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 +
I*a^6*d^6)*g^4) - 60*b^2*d^3*log(d*x + c)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 1
5*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5
*b*c*d^5 + I*a^6*d^6)*g^4) + (60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d +
 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^
3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(
b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((I*b^8*c
^5*d^2 - 5*I*a*b^7*c^4*d^3 + 10*I*a^2*b^6*c^3*d^4 - 10*I*a^3*b^5*c^2*d^5 +
5*I*a^4*b^4*c*d^6 - I*a^5*b^3*d^7)*g^4*x^5 + (2*I*b^8*c^6*d - 7*I*a*b^7*c^5
*d^2 + 5*I*a^2*b^6*c^4*d^3 + 10*I*a^3*b^5*c^3*d^4 - 20*I*a^4*b^4*c^2*d^5 +
13*I*a^5*b^3*c*d^6 - 3*I*a^6*b^2*d^7)*g^4*x^4 + (I*b^8*c^7 + I*a*b^7*c^6*d
- 17*I*a^2*b^6*c^5*d^2 + 35*I*a^3*b^5*c^4*d^3 - 25*I*a^4*b^4*c^3*d^4 - I*a^
5*b^3*c^2*d^5 + 9*I*a^6*b^2*c*d^6 - 3*I*a^7*b*d^7)*g^4*x^3 + (3*I*a*b^7*c^7
```

- 9*I*a^2*b^6*c^6*d + I*a^3*b^5*c^5*d^2 + 25*I*a^4*b^4*c^4*d^3 - 35*I*a^5*
b^3*c^3*d^4 + 17*I*a^6*b^2*c^2*d^5 - I*a^7*b*c*d^6 - I*a^8*d^7)*g^4*x^2 + (
3*I*a^2*b^6*c^7 - 13*I*a^3*b^5*c^6*d + 20*I*a^4*b^4*c^5*d^2 - 10*I*a^5*b^3*
c^4*d^3 - 5*I*a^6*b^2*c^3*d^4 + 7*I*a^7*b*c^2*d^5 - 2*I*a^8*c*d^6)*g^4*x +
(I*a^3*b^5*c^7 - 5*I*a^4*b^4*c^6*d + 10*I*a^5*b^3*c^5*d^2 - 10*I*a^6*b^2*c^
4*d^3 + 5*I*a^7*b*c^3*d^4 - I*a^8*c^2*d^5)*g^4))*log((b*x/(d*x + c) + a/(d*
x + c))^n*e) + 1/36*(-4*I*b^5*c^5 + 45*I*a*b^4*c^4*d - 360*I*a^2*b^3*c^3*d^
2 + 490*I*a^3*b^2*c^2*d^3 - 180*I*a^4*b*c*d^4 + 9*I*a^5*d^5 - 120*(I*b^5*c*
d^4 - I*a*b^4*d^5)*x^4 - 120*(3*I*b^5*c^2*d^3 - 2*I*a*b^4*c*d^4 - I*a^2*b^3
*d^5)*x^3 - 20*(11*I*b^5*c^3*d^2 + 21*I*a*b^4*c^2*d^3 - 39*I*a^2*b^3*c*d^4
+ 7*I*a^3*b^2*d^5)*x^2 - 180*(-I*b^5*d^5*x^5 - I*a^3*b^2*c^2*d^3 + (-2*I*b^
5*c*d^4 - 3*I*a*b^4*d^5)*x^4 + (-I*b^5*c^2*d^3 - 6*I*a*b^4*c*d^4 - 3*I*a^2*
b^3*d^5)*x^3 + (-3*I*a*b^4*c^2*d^3 - 6*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*x^2
+ (-3*I*a^2*b^3*c^2*d^3 - 2*I*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 - 180*(-I*b
^5*d^5*x^5 - I*a^3*b^2*c^2*d^3 + (-2*I*b^5*c*d^4 - 3*I*a*b^4*d^5)*x^4 + (-I
*b^5*c^2*d^3 - 6*I*a*b^4*c*d^4 - 3*I*a^2*b^3*d^5)*x^3 + (-3*I*a*b^4*c^2*d^3
- 6*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*x^2 + (-3*I*a^2*b^3*c^2*d^3 - 2*I*a^3
*b^2*c*d^4)*x)*log(d*x + c)^2 - 5*(-5*I*b^5*c^4*d + 108*I*a*b^4*c^3*d^2 - 7
8*I*a^2*b^3*c^2*d^3 - 52*I*a^3*b^2*c*d^4 + 27*I*a^4*b*d^5)*x - 120*(I*b^5*d
^5*x^5 + I*a^3*b^2*c^2*d^3 + (2*I*b^5*c*d^4 + 3*I*a*b^4*d^5)*x^4 + (I*b^5*c
^2*d^3 + 6*I*a*b^4*c*d^4 + 3*I*a^2*b^3*d^5)*x^3 + (3*I*a*b^4*c^2*d^3 + 6*I*
a^2*b^3*c*d^4 + I*a^3*b^2*d^5)*x^2 + (3*I*a^2*b^3*c^2*d^3 + 2*I*a^3*b^2*c*d
^4)*x)*log(b*x + a) - 120*(-I*b^5*d^5*x^5 - I*a^3*b^2*c^2*d^3 + (-2*I*b^5*c
*d^4 - 3*I*a*b^4*d^5)*x^4 + (-I*b^5*c^2*d^3 - 6*I*a*b^4*c*d^4 - 3*I*a^2*b^3
*d^5)*x^3 + (-3*I*a*b^4*c^2*d^3 - 6*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*x^2 +
(-3*I*a^2*b^3*c^2*d^3 - 2*I*a^3*b^2*c*d^4)*x + 3*(I*b^5*d^5*x^5 + I*a^3*b^2
*c^2*d^3 + (2*I*b^5*c*d^4 + 3*I*a*b^4*d^5)*x^4 + (I*b^5*c^2*d^3 + 6*I*a*b^4
*c*d^4 + 3*I*a^2*b^3*d^5)*x^3 + (3*I*a*b^4*c^2*d^3 + 6*I*a^2*b^3*c*d^4 + I*
a^3*b^2*d^5)*x^2 + (3*I*a^2*b^3*c^2*d^3 + 2*I*a^3*b^2*c*d^4)*x)*log(b*x + a
))*log(d*x + c))*B*n/(a^3*b^6*c^8*g^4 - 6*a^4*b^5*c^7*d*g^4 + 15*a^5*b^4*c^
6*d^2*g^4 - 20*a^6*b^3*c^5*d^3*g^4 + 15*a^7*b^2*c^4*d^4*g^4 - 6*a^8*b*c^3*d
^5*g^4 + a^9*c^2*d^6*g^4 + (b^9*c^6*d^2*g^4 - 6*a*b^8*c^5*d^3*g^4 + 15*a^2*
b^7*c^4*d^4*g^4 - 20*a^3*b^6*c^3*d^5*g^4 + 15*a^4*b^5*c^2*d^6*g^4 - 6*a^5*b
^4*c*d^7*g^4 + a^6*b^3*d^8*g^4)*x^5 + (2*b^9*c^7*d*g^4 - 9*a*b^8*c^6*d^2*g^
4 + 12*a^2*b^7*c^5*d^3*g^4 + 5*a^3*b^6*c^4*d^4*g^4 - 30*a^4*b^5*c^3*d^5*g^4
+ 33*a^5*b^4*c^2*d^6*g^4 - 16*a^6*b^3*c*d^7*g^4 + 3*a^7*b^2*d^8*g^4)*x^4 +
(b^9*c^8*g^4 - 18*a^2*b^7*c^6*d^2*g^4 + 52*a^3*b^6*c^5*d^3*g^4 - 60*a^4*b^
5*c^4*d^4*g^4 + 24*a^5*b^4*c^3*d^5*g^4 + 10*a^6*b^3*c^2*d^6*g^4 - 12*a^7*b^
2*c*d^7*g^4 + 3*a^8*b*d^8*g^4)*x^3 + (3*a*b^8*c^8*g^4 - 12*a^2*b^7*c^7*d*g^
4 + 10*a^3*b^6*c^6*d^2*g^4 + 24*a^4*b^5*c^5*d^3*g^4 - 60*a^5*b^4*c^4*d^4*g^
4 + 52*a^6*b^3*c^3*d^5*g^4 - 18*a^7*b^2*c^2*d^6*g^4 + a^9*d^8*g^4)*x^2 + (3
*a^2*b^7*c^8*g^4 - 16*a^3*b^6*c^7*d*g^4 + 33*a^4*b^5*c^6*d^2*g^4 - 30*a^5*b
^4*c^5*d^3*g^4 + 5*a^6*b^3*c^4*d^4*g^4 + 12*a^7*b^2*c^3*d^5*g^4 - 9*a^8*b*c
^2*d^6*g^4 + 2*a^9*c*d^7*g^4)*x) + 1/6*A*(60*b^2*d^3*log(b*x + a)/((I*b^6*c
^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a

```
^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) - 60*b^2*d^3*log(d*x + c
)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d
^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) + (60*b^4*d^4
*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3
*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^
3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^
2*c*d^3 - 3*a^3*b*d^4)*x)/((I*b^8*c^5*d^2 - 5*I*a*b^7*c^4*d^3 + 10*I*a^2*b^
6*c^3*d^4 - 10*I*a^3*b^5*c^2*d^5 + 5*I*a^4*b^4*...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1922 vs. $2(545) = 1090$.
time = 0.60, size = 1922, normalized size = 3.27

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] -1/36*(12*(I*A + I*B)*b^5*c^5 + 90*(-I*A - I*B)*a*b^4*c^4*d + 360*(I*A + I*
B)*a^2*b^3*c^3*d^2 + 120*(-I*A - I*B)*a^3*b^2*c^2*d^3 + 180*(-I*A - I*B)*a^
4*b*c*d^4 + 18*(I*A + I*B)*a^5*d^5 + 120*(3*(I*A + I*B)*b^5*c*d^4 + 3*(-I*A
 - I*B)*a*b^4*d^5 + (I*B*b^5*c*d^4 - I*B*a*b^4*d^5)*n)*x^4 + 60*(9*(I*A + I
*B)*b^5*c^2*d^3 + 6*(I*A + I*B)*a*b^4*c*d^4 + 15*(-I*A - I*B)*a^2*b^3*d^5 +
 2*(3*I*B*b^5*c^2*d^3 - 2*I*B*a*b^4*c*d^4 - I*B*a^2*b^3*d^5)*n)*x^3 + 20*(6
*(I*A + I*B)*b^5*c^3*d^2 + 63*(I*A + I*B)*a*b^4*c^2*d^3 + 36*(-I*A - I*B)*a
^2*b^3*c*d^4 + 33*(-I*A - I*B)*a^3*b^2*d^5 + (11*I*B*b^5*c^3*d^2 + 21*I*B*a
*b^4*c^2*d^3 - 39*I*B*a^2*b^3*c*d^4 + 7*I*B*a^3*b^2*d^5)*n)*x^2 + 180*(I*B*
b^5*d^5*n*x^5 + I*B*a^3*b^2*c^2*d^3*n + (2*I*B*b^5*c*d^4 + 3*I*B*a*b^4*d^5)
*n*x^4 + (I*B*b^5*c^2*d^3 + 6*I*B*a*b^4*c*d^4 + 3*I*B*a^2*b^3*d^5)*n*x^3 +
(3*I*B*a*b^4*c^2*d^3 + 6*I*B*a^2*b^3*c*d^4 + I*B*a^3*b^2*d^5)*n*x^2 + (3*I*
B*a^2*b^3*c^2*d^3 + 2*I*B*a^3*b^2*c*d^4)*n*x)*log((b*x + a)/(d*x + c))^2 -
(-4*I*B*b^5*c^5 + 45*I*B*a*b^4*c^4*d - 360*I*B*a^2*b^3*c^3*d^2 + 490*I*B*a^
3*b^2*c^2*d^3 - 180*I*B*a^4*b*c*d^4 + 9*I*B*a^5*d^5)*n + 5*(6*(-I*A - I*B)*
b^5*c^4*d + 72*(I*A + I*B)*a*b^4*c^3*d^2 + 144*(I*A + I*B)*a^2*b^3*c^2*d^3
+ 192*(-I*A - I*B)*a^3*b^2*c*d^4 + 18*(-I*A - I*B)*a^4*b*d^5 + (-5*I*B*b^5*
c^4*d + 108*I*B*a*b^4*c^3*d^2 - 78*I*B*a^2*b^3*c^2*d^3 - 52*I*B*a^3*b^2*c*d
^4 + 27*I*B*a^4*b*d^5)*n)*x + 6*(60*(I*A + I*B)*a^3*b^2*c^2*d^3 + 20*(I*B*b
^5*d^5*n + 3*(I*A + I*B)*b^5*d^5)*x^5 + 20*(5*I*B*b^5*c*d^4*n + 6*(I*A + I*
B)*b^5*c*d^4 + 9*(I*A + I*B)*a*b^4*d^5)*x^4 + 10*(6*(I*A + I*B)*b^5*c^2*d^3
 + 36*(I*A + I*B)*a*b^4*c*d^4 + 18*(I*A + I*B)*a^2*b^3*d^5 + (11*I*B*b^5*c^
2*d^3 + 18*I*B*a*b^4*c*d^4 - 9*I*B*a^2*b^3*d^5)*n)*x^3 + 10*(18*(I*A + I*B)
*a*b^4*c^2*d^3 + 36*(I*A + I*B)*a^2*b^3*c*d^4 + 6*(I*A + I*B)*a^3*b^2*d^5 +
 (2*I*B*b^5*c^3*d^2 + 27*I*B*a*b^4*c^2*d^3 - 9*I*B*a^3*b^2*d^5)*n)*x^2 + (2
*I*B*b^5*c^5 - 15*I*B*a*b^4*c^4*d + 60*I*B*a^2*b^3*c^3*d^2 - 30*I*B*a^4*b*c
```

```
*d^4 + 3*I*B*a^5*d^5)*n + 5*(36*(I*A + I*B)*a^2*b^3*c^2*d^3 + 24*(I*A + I*B
)*a^3*b^2*c*d^4 + (-I*B*b^5*c^4*d + 12*I*B*a*b^4*c^3*d^2 + 36*I*B*a^2*b^3*c
^2*d^3 - 24*I*B*a^3*b^2*c*d^4 - 3*I*B*a^4*b*d^5)*n)*x)*log((b*x + a)/(d*x +
 c)))/((b^9*c^6*d^2 - 6*a*b^8*c^5*d^3 + 15*a^2*b^7*c^4*d^4 - 20*a^3*b^6*c^3
*d^5 + 15*a^4*b^5*c^2*d^6 - 6*a^5*b^4*c*d^7 + a^6*b^3*d^8)*g^4*x^5 + (2*b^9
*c^7*d - 9*a*b^8*c^6*d^2 + 12*a^2*b^7*c^5*d^3 + 5*a^3*b^6*c^4*d^4 - 30*a^4*
b^5*c^3*d^5 + 33*a^5*b^4*c^2*d^6 - 16*a^6*b^3*c*d^7 + 3*a^7*b^2*d^8)*g^4*x^
4 + (b^9*c^8 - 18*a^2*b^7*c^6*d^2 + 52*a^3*b^6*c^5*d^3 - 60*a^4*b^5*c^4*d^4
 + 24*a^5*b^4*c^3*d^5 + 10*a^6*b^3*c^2*d^6 - 12*a^7*b^2*c*d^7 + 3*a^8*b*d^8
)*g^4*x^3 + (3*a*b^8*c^8 - 12*a^2*b^7*c^7*d + 10*a^3*b^6*c^6*d^2 + 24*a^4*b
^5*c^5*d^3 - 60*a^5*b^4*c^4*d^4 + 52*a^6*b^3*c^3*d^5 - 18*a^7*b^2*c^2*d^6 +
 a^9*d^8)*g^4*x^2 + (3*a^2*b^7*c^8 - 16*a^3*b^6*c^7*d + 33*a^4*b^5*c^6*d^2
- 30*a^5*b^4*c^5*d^3 + 5*a^6*b^3*c^4*d^4 + 12*a^7*b^2*c^3*d^5 - 9*a^8*b*c^2
*d^6 + 2*a^9*c*d^7)*g^4*x + (a^3*b^6*c^8 - 6*a^4*b^5*c^7*d + 15*a^5*b^4*c^6
*d^2 - 20*a^6*b^3*c^5*d^3 + 15*a^7*b^2*c^4*d^4 - 6*a^8*b*c^3*d^5 + a^9*c^2*
d^6)*g^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)/((b*g*x + a*g)^4*(I*d*x +
I*c)^3), x)
```

Mupad [**B**]
time = 10.22, size = 2400, normalized size = 4.09

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/((a*g + b*g*x)^4*(c*i + d*i*x)^3
),x)

[Out] log(e*((a + b*x)/(c + d*x))^n)*((x*((5*B*(2*a*b*d^2 + b^2*c*d)*(a*d + b*c))
/(3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) - (5*B*b*d)/(6*(a^2*d^2 + b^2*c^2 -
2*a*b*c*d)) + (5*B*a*b^2*c*d^2)/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + x^2*((
5*B*b*d*(2*a*b*d^2 + b^2*c*d))/(3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (5*B
*b^2*d^2*(a*d + b*c))/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) - (B*(3*a*d + 2*b*
c))/(6*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (5*B*a*c*(2*a*b*d^2 + b^2*c*d))/(
3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (5*B*b^3*d^3*x^3)/(a^2*d^2 + b^2*c^2
 - 2*a*b*c*d)^2)/(x*(2*a^3*c*d*g^4*i^3 + 3*a^2*b*c^2*g^4*i^3) + x^2*(a^3*d^
2*g^4*i^3 + 3*a*b^2*c^2*g^4*i^3 + 6*a^2*b*c*d*g^4*i^3) + x^3*(b^3*c^2*g^4*i
^3 + 3*a^2*b*d^2*g^4*i^3 + 6*a*b^2*c*d*g^4*i^3) + x^4*(2*b^3*c*d*g^4*i^3 +
3*a*b^2*d^2*g^4*i^3) + a^3*c^2*g^4*i^3 + b^3*d^2*g^4*i^3*x^5) + (10*B*b^2*d
^3*(x^2*((g^4*i^3*n*(a*d + b*c)^2*(a*d - b*c))/d + 2*a*b*c*g^4*i^3*n*(a*d -
 b*c)) + b^2*d*g^4*i^3*n*x^4*(a*d - b*c) + (a^2*c^2*g^4*i^3*n*(a*d - b*c))/
d + 2*b*g^4*i^3*n*x^3*(a*d + b*c)*(a*d - b*c) + (2*a*c*g^4*i^3*n*x*(a*d + b
c)(a*d - b*c))/d))/(g^4*i^3*n*(a*d - b*c)^6*(x*(2*a^3*c*d*g^4*i^3 + 3*a^2
*b*c^2*g^4*i^3) + x^2*(a^3*d^2*g^4*i^3 + 3*a*b^2*c^2*g^4*i^3 + 6*a^2*b*c*d*
g^4*i^3) + x^3*(b^3*c^2*g^4*i^3 + 3*a^2*b*d^2*g^4*i^3 + 6*a*b^2*c*d*g^4*i^3
) + x^4*(2*b^3*c*d*g^4*i^3 + 3*a*b^2*d^2*g^4*i^3) + a^3*c^2*g^4*i^3 + b^3*d
^2*g^4*i^3*x^5))) + ((12*A*b^4*c^4 - 18*A*a^4*d^4 + 9*B*a^4*d^4*n + 4*B*b^4
*c^4*n + 282*A*a^2*b^2*c^2*d^2 - 78*A*a*b^3*c^3*d + 162*A*a^3*b*c*d^3 + 319
*B*a^2*b^2*c^2*d^2*n - 41*B*a*b^3*c^3*d*n - 171*B*a^3*b*c*d^3*n)/(6*(a*d -
b*c)) + (5*x*(18*A*a^3*b*d^4 - 6*A*b^4*c^3*d + 66*A*a*b^3*c^2*d^2 + 210*A*a
^2*b^2*c*d^3 - 27*B*a^3*b*d^4*n - 5*B*b^4*c^3*d*n + 103*B*a*b^3*c^2*d^2*n +
 25*B*a^2*b^2*c*d^3*n))/(6*(a*d - b*c)) + (20*x^4*(3*A*b^4*d^4 + B*b^4*d^4*
n))/(a*d - b*c) + (10*x^2*(33*A*a^2*b^2*d^4 + 6*A*b^4*c^2*d^2 - 7*B*a^2*b^2
*d^4*n + 11*B*b^4*c^2*d^2*n + 69*A*a*b^3*c*d^3 + 32*B*a*b^3*c*d^3*n))/(3*(a
*d - b*c)) + (10*x^3*(15*A*a*b^3*d^4 + 9*A*b^4*c*d^3 + 2*B*a*b^3*d^4*n + 6*
B*b^4*c*d^3*n))/(a*d - b*c))/(x^5*(6*a^4*b^3*d^6*g^4*i^3 + 6*b^7*c^4*d^2*g^
4*i^3 - 24*a*b^6*c^3*d^3*g^4*i^3 - 24*a^3*b^4*c*d^5*g^4*i^3 + 36*a^2*b^5*c^
2*d^4*g^4*i^3) + x*(18*a^2*b^5*c^6*g^4*i^3 + 12*a^7*c*d^5*g^4*i^3 - 60*a^3*
b^4*c^5*d*g^4*i^3 - 30*a^6*b*c^2*d^4*g^4*i^3 + 60*a^4*b^3*c^4*d^2*g^4*i^3)
+ x^2*(6*a^7*d^6*g^4*i^3 + 18*a*b^6*c^6*g^4*i^3 + 12*a^6*b*c*d^5*g^4*i^3 -
36*a^2*b^5*c^5*d*g^4*i^3 - 30*a^3*b^4*c^4*d^2*g^4*i^3 + 120*a^4*b^3*c^3*d^3
*g^4*i^3 - 90*a^5*b^2*c^2*d^4*g^4*i^3) + x^3*(6*b^7*c^6*g^4*i^3 + 18*a^6*b*
d^6*g^4*i^3 + 12*a*b^6*c^5*d*g^4*i^3 - 36*a^5*b^2*c*d^5*g^4*i^3 - 90*a^2*b^
5*c^4*d^2*g^4*i^3 + 120*a^3*b^4*c^3*d^3*g^4*i^3 - 30*a^4*b^3*c^2*d^4*g^4*i^
3) + x^4*(18*a^5*b^2*d^6*g^4*i^3 + 12*b^7*c^5*d*g^4*i^3 - 30*a*b^6*c^4*d^2*
g^4*i^3 - 60*a^4*b^3*c*d^5*g^4*i^3 + 60*a^3*b^4*c^2*d^4*g^4*i^3) + 6*a^3*b^
4*c^6*g^4*i^3 + 6*a^7*c^2*d^4*g^4*i^3 - 24*a^4*b^3*c^5*d*g^4*i^3 - 24*a^6*b
*c^3*d^3*g^4*i^3 + 36*a^5*b^2*c^4*d^2*g^4*i^3) + (b^2*d^3*atan((b^2*d^3*(3*
A + B*n)*((a^6*d^6*g^4*i^3 - b^6*c^6*g^4*i^3 + 4*a*b^5*c^5*d*g^4*i^3 - 4*a^
5*b*c*d^5*g^4*i^3 - 5*a^2*b^4*c^4*d^2*g^4*i^3 + 5*a^4*b^2*c^2*d^4*g^4*i^3)/

```
(a^5*d^5*g^4*i^3 - b^5*c^5*g^4*i^3 + 5*a*b^4*c^4*d*g^4*i^3 - 5*a^4*b*c*d^4*
g^4*i^3 - 10*a^2*b^3*c^3*d^2*g^4*i^3 + 10*a^3*b^2*c^2*d^3*g^4*i^3) + 2*b*d*
x)*(a^5*d^5*g^4*i^3 - b^5*c^5*g^4*i^3 + 5*a*b^4*c^4*d*g^4*i^3 - 5*a^4*b*c*d
^4*g^4*i^3 - 10*a^2*b^3*c^3*d^2*g^4*i^3 + 10*a^3*b^2*c^2*d^3*g^4*i^3)*10i)/
(g^4*i^3*(30*A*b^2*d^3 + 10*B*b^2*d^3*n)*(a*d - b*c)^6))*(3*A + B*n)*20i)/(
3*g^4*i^3*(a*d - b*c)^6) - (5*B*b^2*d^3*log(e*((a + b*x)/(c + d*x))^n)^2)/(
g^4*i^3*n*(a*d - b*c)^6)
```

3.159 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=584

$$\frac{3B^2(bc-ad)^4g^3in^2x}{10bd^3}-\frac{3B^2(bc-ad)^3g^3in^2(c+dx)^2}{20d^4}+\frac{bB^2(bc-ad)^2g^3in^2(c+dx)^3}{30d^4}-\frac{B(bc-ad)^2g^3in(a+$$

```
[Out] 3/10*B^2*(-a*d+b*c)^4*g^3*i*n^2*x/b/d^3-3/20*B^2*(-a*d+b*c)^3*g^3*i*n^2*(d*
x+c)^2/d^4+1/30*b*B^2*(-a*d+b*c)^2*g^3*i*n^2*(d*x+c)^3/d^4-1/30*B*(-a*d+b*c
)^2*g^3*i*n*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d-1/10*B*(-a*d+b*
c)*g^3*i*n*(b*x+a)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2+1/20*(-a*d+b*c)*g^
3*i*(b*x+a)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^2+1/5*g^3*i*(b*x+a)^4*(d*
x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b+1/60*B*(-a*d+b*c)^3*g^3*i*n*(b*x+a
)^2*(3*A+B*n+3*B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d^2-1/60*B*(-a*d+b*c)^4*g^3
*i*n*(b*x+a)*(6*A+5*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d^3-1/60*B*(-a*d
+b*c)^5*g^3*i*n*(6*A+11*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/
(d*x+c))/b^2/d^4-1/10*B^2*(-a*d+b*c)^5*g^3*i*n^2*ln(d*x+c)/b^2/d^4-1/10*B^2
*(-a*d+b*c)^5*g^3*i*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^2/d^4
```

Rubi [A]

time = 0.50, antiderivative size = 584, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.186$, Rules used = {2561, 2383, 2381, 2384, 2354, 2438, 2373, 45}

$$-\frac{B^2g^3in^2(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{10b^2d^4}-\frac{Bg^3in(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+11Bn\right)}{60b^2d^4}-\frac{Bg^3in(a+bx)(bc-ad)^4\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+5Bn\right)}{60b^2d^3}+\frac{Bg^3in(a+bx)^2(bc-ad)^3\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{60b^2d^2}-\frac{Bg^3in(a+bx)^3(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{30b^2d}+\frac{g^3i(a+bx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{20b^2}-\frac{Bg^3in(a+bx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{10b^2}+\frac{g^3i(a+bx)^4(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{5b}-\frac{B^2g^3in^2(bc-ad)^5\log(c+dx)}{10b^2d^4}-\frac{3B^2g^3in^2(c+dx)^2(bc-ad)^3}{20d^4}+\frac{bB^2g^3in^2(c+dx)^3(bc-ad)^2}{30d^4}+\frac{3B^2g^3in^2x(bc-ad)^4}{10bd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,
x]
```

```
[Out] (3*B^2*(b*c - a*d)^4*g^3*i*n^2*x)/(10*b*d^3) - (3*B^2*(b*c - a*d)^3*g^3*i*n
^2*(c + d*x)^2)/(20*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i*n^2*(c + d*x)^3)/(30*
d^4) - (B*(b*c - a*d)^2*g^3*i*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(30*b^2*d) - (B*(b*c - a*d)*g^3*i*n*(a + b*x)^4*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(10*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])^2)/(20*b^2) + (g^3*i*(a + b*x)^4*(c + d*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b) + (B*(b*c - a*d)^3*g^3*i*n*(a +
 b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(60*b^2*d^2) - (B
*(b*c - a*d)^4*g^3*i*n*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d
*x))^n]))/(60*b^2*d^3) - (B*(b*c - a*d)^5*g^3*i*n*(6*A + 11*B*n + 6*B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(60*b^2*d^4) - (
B^2*(b*c - a*d)^5*g^3*i*n^2*Log[c + d*x])/(10*b^2*d^4) - (B^2*(b*c - a*d)^5
*g^3*i*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(10*b^2*d^4)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (159c+159dx)(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(\frac{159(bc-ad)(ag+bgx)^3\left(A+B\log\right.}{b}\right.$$

$$= \frac{(159(bc-ad))\int (ag+bgx)^3\left(A+B\log\right.}{b}$$

$$= \frac{159(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{4b^2}$$

$$= \frac{159(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{4b^2}$$

$$= \frac{159(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{4b^2}$$

$$= \frac{159(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{4b^2}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} + \frac{159B(bc-ad}{}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} - \frac{159B^2(bc-a}{}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} - \frac{159B^2(bc-a}{}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} + \frac{53B^2(bc-ad}{20bd^3}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} + \frac{53B^2(bc-ad}{20bd^3}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} + \frac{53B^2(bc-ad}{20bd^3}$$

Mathematica [**A**]
time = 0.53, size = 949, normalized size = 1.62

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2,x]
```

```
[Out] (g^3*i*(5*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
+ 4*d*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (5*B*(b*c - a*
d)^2*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a +
 b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[e*((a +
b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x - d
^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n*(b*d*x
 + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a + b*x))
/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])))/(3*d^4) + (B*(b*c - a*d)*n*(24*A*b*d*(b*c - a*d)^3*x + 24*B
*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 12*d^2*(b*c - a
*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*d^3*(b*c - a*d
)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*d^4*(a + b*x)^4*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*x] -
24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 4*B*
(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Lo
g[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)
*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*
c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c - a*d)^4*n*(
(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4)))/(20*b^2)
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int (bgx + ag)^3 (dix + ci) \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3392 vs. 2(554) = 1108.
time = 0.86, size = 3392, normalized size = 5.81

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 2/5*I*A*B*b^3*d*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/5*I*A^2*
b^3*d*g^3*x^5 + 1/2*I*A*B*b^3*c*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n
```

*e) + 3/2*I*A*B*a*b^2*d*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/
4*I*A^2*b^3*c*g^3*x^4 + 3/4*I*A^2*a*b^2*d*g^3*x^4 + 2*I*A*B*a*b^2*c*g^3*x^3
*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 2*I*A*B*a^2*b*d*g^3*x^3*log((b*x/
(d*x + c) + a/(d*x + c))^n*e) + I*A^2*a*b^2*c*g^3*x^3 + I*A^2*a^2*b*d*g^3*x
^3 + 3*I*A*B*a^2*b*c*g^3*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + I*A*B
*a^3*d*g^3*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 3/2*I*A^2*a^2*b*c*g
^3*x^2 + 1/2*I*A^2*a^3*d*g^3*x^2 + 1/30*I*A*B*b^3*d*g^3*n*(12*a^5*log(b*x +
 a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4
*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 -
 a^4*d^4)*x)/(b^4*d^4)) - 1/12*I*A*B*b^3*c*g^3*n*(6*a^4*log(b*x + a)/b^4 -
6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^
2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/4*I*A*B*a*b^2*d*g^3*
n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*
d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^
3)) + I*A*B*a*b^2*c*g^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3
- ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + I*A*B*a^
2*b*d*g^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d -
a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3*I*A*B*a^2*b*c*g^3*n*
(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - I*A*B
*a^3*d*g^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(
b*d)) + 2*I*A*B*a^3*c*g^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*I*A*B
*a^3*c*g^3*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + I*A^2*a^3*c*g^3*x - 1
/60*(6*I*a^4*c*d^4*g^3*n^2 + (-5*I*n^2 - 6*I*n)*b^4*c^5*g^3 + (19*I*n^2 + 3
0*I*n)*a*b^3*c^4*d*g^3 + (-23*I*n^2 - 60*I*n)*a^2*b^2*c^3*d^2*g^3 - 3*(-I*n
^2 - 20*I*n)*a^3*b*c^2*d^3*g^3)*B^2*log(d*x + c)/(b*d^4) - 1/10*(-I*b^5*c^5
*g^3*n^2 + 5*I*a*b^4*c^4*d*g^3*n^2 - 10*I*a^2*b^3*c^3*d^2*g^3*n^2 + 10*I*a^
3*b^2*c^2*d^3*g^3*n^2 - 5*I*a^4*b*c*d^4*g^3*n^2 + I*a^5*d^5*g^3*n^2)*(log(b
*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*
d)))*B^2/(b^2*d^4) + 1/60*(12*I*B^2*b^5*d^5*g^3*x^5 - 3*(b^5*c*d^4*g^3*(2*I
*n - 5*I) + a*b^4*d^5*g^3*(-2*I*n - 15*I))*B^2*x^4 - 2*((-I*n^2 + I*n)*b^5*
c^2*d^3*g^3 + 2*(I*n^2 + 5*I*n - 15*I)*a*b^4*c*d^4*g^3 + (-I*n^2 - 11*I*n -
 30*I)*a^2*b^3*d^5*g^3)*B^2*x^3 + ((-2*I*n^2 + 3*I*n)*b^5*c^3*d^2*g^3 - 3*(
-4*I*n^2 + 5*I*n)*a*b^4*c^2*d^3*g^3 - 3*(6*I*n^2 + 5*I*n - 30*I)*a^2*b^3*c*
d^4*g^3 + (8*I*n^2 + 27*I*n + 30*I)*a^3*b^2*d^5*g^3)*B^2*x^2 - 3*(5*I*a^4*b
*c*d^4*g^3*n^2 - I*a^5*d^5*g^3*n^2)*B^2*log(b*x + a)^2 - 6*(I*b^5*c^5*g^3*n
^2 - 5*I*a*b^4*c^4*d*g^3*n^2 + 10*I*a^2*b^3*c^3*d^2*g^3*n^2 - 10*I*a^3*b^2*
c^2*d^3*g^3*n^2)*B^2*log(b*x + a)*log(d*x + c) - 3*(-I*b^5*c^5*g^3*n^2 + 5*
I*a*b^4*c^4*d*g^3*n^2 - 10*I*a^2*b^3*c^3*d^2*g^3*n^2 + 10*I*a^3*b^2*c^2*d^3
*g^3*n^2)*B^2*log(d*x + c)^2 + ((I*n^2 - 6*I*n)*b^5*c^4*d*g^3 - 2*(4*I*n^2
- 15*I*n)*a*b^4*c^3*d^2*g^3 - 12*(-2*I*n^2 + 5*I*n)*a^2*b^3*c^2*d^3*g^3 - 2
*(14*I*n^2 - 15*I*n - 30*I)*a^3*b^2*c*d^4*g^3 + (11*I*n^2 + 6*I*n)*a^4*b*d^
5*g^3)*B^2*x + (-6*I*a*b^4*c^4*d*g^3*n^2 + 27*I*a^2*b^3*c^3*d^2*g^3*n^2 - 4
7*I*a^3*b^2*c^2*d^3*g^3*n^2 + (31*I*n^2 + 30*I*n)*a^4*b*c*d^4*g^3 + (-5*I*n
^2 - 6*I*n)*a^5*d^5*g^3)*B^2*log(b*x + a) - 3*(-4*I*B^2*b^5*d^5*g^3*x^5 - 2
0*I*B^2*a^3*b^2*c*d^4*g^3*x + 5*(-I*b^5*c*d^4*g^3 - 3*I*a*b^4*d^5*g^3)*B^2*

```
x^4 + 20*(-I*a*b^4*c*d^4*g^3 - I*a^2*b^3*d^5*g^3)*B^2*x^3 + 10*(-3*I*a^2*b^
3*c*d^4*g^3 - I*a^3*b^2*d^5*g^3)*B^2*x^2)*log((b*x + a)^n)^2 - 3*(-4*I*B^2*
b^5*d^5*g^3*x^5 - 20*I*B^2*a^3*b^2*c*d^4*g^3*x + 5*(-I*b^5*c*d^4*g^3 - 3*I*
a*b^4*d^5*g^3)*B^2*x^4 + 20*(-I*a*b^4*c*d^4*g^3 - I*a^2*b^3*d^5*g^3)*B^2*x^
3 + 10*(-3*I*a^2*b^3*c*d^4*g^3 - I*a^3*b^2*d^5*g^3)*B^2*x^2)*log((d*x + c)^
n)^2 + (24*I*B^2*b^5*d^5*g^3*x^5 - 6*(b^5*c*d^4*g^3*(I*n - 5*I) + a*b^4*d^5
*g^3*(-I*n - 15*I))*B^2*x^4 - 2*(I*b^5*c^2*d^3*g^3*n + 10*a*b^4*c*d^4*g^3*(
I*n - 6*I) + a^2*b^3*d^5*g^3*(-11*I*n - 60*I))*B^2*x^3 - 3*(-I*b^5*c^3*d^2*
g^3*n + 5*I*a*b^4*c^2*d^3*g^3*n + 5*a^2*b^3*c*d^4*g^3*(I*n - 12*I) + a^3*b^
2*d^5*g^3*(-9*I*n - 20*I))*B^2*x^2 - 6*(I*b^5*c^4*d*g^3*n - 5*I*a*b^4*c^3*d
^2*g^3*n + 10*I*a^2*b^3*c^2*d^3*g^3*n - I*a^4*b*d^5*g^3*n + 5*a^3*b^2*c*d^4
*g^3*(-I*n - 4*I))*B^2*x - 6*(-5*I*a^4*b*c*d^4*g^3*n + I*a^5*d^5*g^3*n)*B^2
*log(b*x + a) - 6*(-I*b^5*c^5*g^3*n + 5*I*a*b^4*c^4*d*g^3*n - 10*I*a^2*b^3*
c^3*d^2*g^3*n + 10*I*a^3*b^2*c^2*d^3*g^3*n)*B^2*log(d*x + c))*log((b*x + a)
^n) + (-24*I*B^2*b^5*d^5*g^3*x^5 - 6*(a*b^4*d^5*g^3*(I*n + 15*I) + b^5*c*d^
4*g^3*(-I*n + 5*I))*B^2*x^4 - 2*(-I*b^5*c^2*d^3*g^3*n + a^2*b^3*d^5*g^3*(11
*I*n + 60*I) + 10*a*b^4*c*d^4*g^3*(-I*n + 6*I))*B^2*x^3 - 3*(I*b^5*c^3*d^2*
g^3*n - 5*I*a*b^4*c^2*d^3*g^3*n + a^3*b^2*d^5*g^3*(9*I*n + 20*I) + 5*a^2*b^
3*c*d^4*g^3*(-I*n + 12*I))*B^2*x^2 - 6*(-I*b^5*c^4*d*g^3*n + 5*I*a*b^4*c^3*
d^2*g^3*n - 10*I*a^2*b^3*c^2*d^3*g^3*n + I*a^4*...
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="fricas")
```

```
[Out] 1/20*(4*I*B^2*b^3*d*g^3*n^2*x^5 + 20*I*B^2*a^3*c*g^3*n^2*x - 5*(-I*B^2*b^3*
c - 3*I*B^2*a*b^2*d)*g^3*n^2*x^4 - 20*(-I*B^2*a*b^2*c - I*B^2*a^2*b*d)*g^3*
n^2*x^3 - 10*(-3*I*B^2*a^2*b*c - I*B^2*a^3*d)*g^3*n^2*x^2)*log((b*x + a)/(d
*x + c))^2 + integral(-1/10*(10*(-I*A^2 - 2*I*A*B - I*B^2)*b^4*d^2*g^3*x^6
+ 10*(-I*A^2 - 2*I*A*B - I*B^2)*a^4*c^2*g^3 + 20*((-I*A^2 - 2*I*A*B - I*B^2
)*b^4*c*d + 2*(-I*A^2 - 2*I*A*B - I*B^2)*a*b^3*d^2)*g^3*x^5 + 10*((-I*A^2 -
 2*I*A*B - I*B^2)*b^4*c^2 + 8*(-I*A^2 - 2*I*A*B - I*B^2)*a*b^3*c*d + 6*(-I*
A^2 - 2*I*A*B - I*B^2)*a^2*b^2*d^2)*g^3*x^4 + 40*((-I*A^2 - 2*I*A*B - I*B^2
)*a*b^3*c^2 + 3*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b^2*c*d + (-I*A^2 - 2*I*A*B
- I*B^2)*a^3*b*d^2)*g^3*x^3 + 10*(6*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b^2*c^2
+ 8*(-I*A^2 - 2*I*A*B - I*B^2)*a^3*b*c*d + (-I*A^2 - 2*I*A*B - I*B^2)*a^4*d
^2)*g^3*x^2 + 20*(2*(-I*A^2 - 2*I*A*B - I*B^2)*a^3*b*c^2 + (-I*A^2 - 2*I*A*
B - I*B^2)*a^4*c*d)*g^3*x + (20*(-I*A*B - I*B^2)*b^4*d^2*g^3*n*x^6 + 20*(-I
*A*B - I*B^2)*a^4*c^2*g^3*n + 4*((I*B^2*b^4*c*d - I*B^2*a*b^3*d^2)*g^3*n^2
+ 10*((-I*A*B - I*B^2)*b^4*c*d + 2*(-I*A*B - I*B^2)*a*b^3*d^2)*g^3*n)*x^5 +
```

```
 5*((I*B^2*b^4*c^2 + 2*I*B^2*a*b^3*c*d - 3*I*B^2*a^2*b^2*d^2)*g^3*n^2 + 4*(
(-I*A*B - I*B^2)*b^4*c^2 + 8*(-I*A*B - I*B^2)*a*b^3*c*d + 6*(-I*A*B - I*B^2
)*a^2*b^2*d^2)*g^3*n)*x^4 + 20*((I*B^2*a*b^3*c^2 - I*B^2*a^3*b*d^2)*g^3*n^2
 + 4*((-I*A*B - I*B^2)*a*b^3*c^2 + 3*(-I*A*B - I*B^2)*a^2*b^2*c*d + (-I*A*B
 - I*B^2)*a^3*b*d^2)*g^3*n)*x^3 + 10*((3*I*B^2*a^2*b^2*c^2 - 2*I*B^2*a^3*b*
c*d - I*B^2*a^4*d^2)*g^3*n^2 + 2*(6*(-I*A*B - I*B^2)*a^2*b^2*c^2 + 8*(-I*A*
B - I*B^2)*a^3*b*c*d + (-I*A*B - I*B^2)*a^4*d^2)*g^3*n)*x^2 + 20*((I*B^2*a^
3*b*c^2 - I*B^2*a^4*c*d)*g^3*n^2 + 2*(2*(-I*A*B - I*B^2)*a^3*b*c^2 + (-I*A*
B - I*B^2)*a^4*c*d)*g^3*n)*x)*log((b*x + a)/(d*x + c)))/(b*d*x^2 + a*c + (b
*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(I*d*x + I*c)*(B*log(((b*x + a)/(d*x + c))^n*e) +
 A)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(a\,g+b\,g\,x\right)}^3\,\left(c\,i+d\,i\,x\right)\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,
x)
```

```
[Out] int((a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,
 x)
```

3.160 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=487

$$-\frac{B^2(bc-ad)^3g^2in^2x}{3bd^2}+\frac{B^2(bc-ad)^2g^2in^2(c+dx)^2}{12d^3}-\frac{B(bc-ad)^2g^2in(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{12b^2d}-$$

```
[Out] -1/3*B^2*(-a*d+b*c)^3*g^2*i*n^2*x/b/d^2+1/12*B^2*(-a*d+b*c)^2*g^2*i*n^2*(d*
x+c)^2/d^3-1/12*B*(-a*d+b*c)^2*g^2*i*n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c)
)^n))/b^2/d-1/6*B*(-a*d+b*c)*g^2*i*n*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^
n))/b^2+1/12*(-a*d+b*c)*g^2*i*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b
^2+1/4*g^2*i*(b*x+a)^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b+1/12*B*(
-a*d+b*c)^3*g^2*i*n*(b*x+a)*(2*A+B*n+2*B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d^2
+1/12*B*(-a*d+b*c)^4*g^2*i*n*(2*A+3*B*n+2*B*ln(e*((b*x+a)/(d*x+c))^n))*ln((
-a*d+b*c)/b/(d*x+c))/b^2/d^3+1/6*B^2*(-a*d+b*c)^4*g^2*i*n^2*ln(d*x+c)/b^2/d
^3+1/6*B^2*(-a*d+b*c)^4*g^2*i*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^2/d^3
```

Rubi [A]

time = 0.40, antiderivative size = 487, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.186$, Rules used = {2561, 2383, 2381, 2384, 2354, 2438, 2373, 45}

$$\frac{B^2g^2in^2(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{6b^2d^3}+\frac{Bg^2in(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+3Bn\right)}{12b^2d^3}+\frac{Bg^2in(a+bx)(bc-ad)^3\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+Bn\right)}{12b^2d^2}-\frac{Bg^2in(a+bx)^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{12b^2d}+\frac{g^2i(a+bx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{12b^2}-\frac{Bg^2in(a+bx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6b^2}+\frac{g^2i(a+bx)^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{4b}+\frac{B^2g^2in^2(bc-ad)^4\log(c+dx)}{6b^2d^3}+\frac{B^2g^2in^2(c+dx)^2(bc-ad)^2}{12d^3}-\frac{B^2g^2in^2x(bc-ad)^3}{3bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,
x]
```

```
[Out] -1/3*(B^2*(b*c - a*d)^3*g^2*i*n^2*x)/(b*d^2) + (B^2*(b*c - a*d)^2*g^2*i*n^2
*(c + d*x)^2)/(12*d^3) - (B*(b*c - a*d)^2*g^2*i*n*(a + b*x)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]))/(12*b^2*d) - (B*(b*c - a*d)*g^2*i*n*(a + b*x)^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^2) + ((b*c - a*d)*g^2*i*(a + b
*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(12*b^2) + (g^2*i*(a + b*x)
^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*b) + (B*(b*c - a*
d)^3*g^2*i*n*(a + b*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n]))/(1
2*b^2*d^2) + (B*(b*c - a*d)^4*g^2*i*n*(2*A + 3*B*n + 2*B*Log[e*((a + b*x)/(
c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(12*b^2*d^3) + (B^2*(b*c - a*
d)^4*g^2*i*n^2*Log[c + d*x])/(6*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*n^2*Pol
yLog[2, (d*(a + b*x))/(b*(c + d*x))])/(6*b^2*d^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (160c+160dx)(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx = \int\left(\frac{160(bc-ad)(ag+bgx)^2\left(A+B\log\right.}{b}\right.$$

$$= \frac{(160(bc-ad))\int(ag+bgx)^2\left(A+B\log\right.}{b}$$

$$= \frac{160(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3b^2}$$

$$= \frac{160(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3b^2}$$

$$= \frac{160(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3b^2}$$

$$= \frac{160(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3b^2}$$

$$= \frac{80AB(bc-ad)^3g^2nx}{3bd^2} - \frac{40B(bc-ad)^2g^2}{}$$

$$= \frac{80AB(bc-ad)^3g^2nx}{3bd^2} + \frac{80B^2(bc-ad)^3g}{}$$

$$= \frac{80AB(bc-ad)^3g^2nx}{3bd^2} + \frac{80B^2(bc-ad)^3g}{}$$

$$= \frac{80AB(bc-ad)^3g^2nx}{3bd^2} - \frac{40B^2(bc-ad)^3g}{3bd^2}$$

$$= \frac{80AB(bc-ad)^3g^2nx}{3bd^2} - \frac{40B^2(bc-ad)^3g}{3bd^2}$$

$$= \frac{80AB(bc-ad)^3g^2nx}{3bd^2} - \frac{40B^2(bc-ad)^3g}{3bd^2}$$

Mathematica [A]
time = 0.40, size = 716, normalized size = 1.47

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2,x]
```

```
[Out] (g^2*i*(4*(b*c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
+ 3*d*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (4*B*(b*c - a*
d)^2*n*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x
)/(c + d*x))^n] - d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) -
2*B*(b*c - a*d)^2*n*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(b*d*x + (-(b*c) + a*d)*Log[c
 + d*x]) + B*(b*c - a*d)^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
+ d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3 - (B*
(b*c - a*d)*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[
e*((a + b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d
)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n
*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a
+ b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])))/d^3))/(12*b^2)
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int (bgx + ag)^2 (dix + ci) \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2425 vs. 2(462) = 924.
time = 0.83, size = 2425, normalized size = 4.98

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 1/2*I*A*B*b^2*d*g^2*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/4*I*A^2*
b^2*d*g^2*x^4 + 2/3*I*A*B*b^2*c*g^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n
*e) + 4/3*I*A*B*a*b*d*g^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/3*
I*A^2*b^2*c*g^2*x^3 + 2/3*I*A^2*a*b*d*g^2*x^3 + 2*I*A*B*a*b*c*g^2*x^2*log((
b*x/(d*x + c) + a/(d*x + c))^n*e) + I*A*B*a^2*d*g^2*x^2*log((b*x/(d*x + c)
+ a/(d*x + c))^n*e) + I*A^2*a*b*c*g^2*x^2 + 1/2*I*A^2*a^2*d*g^2*x^2 - 1/12*
I*A*B*b^2*d*g^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^
```

3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3
*d^3)*x)/(b^3*d^3)) + 1/3*I*A*B*b^2*c*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3
*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^
2*d^2)) + 2/3*I*A*B*a*b*d*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*
I*A*B*a*b*c*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d
)*x/(b*d)) - I*A*B*a^2*d*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
 + (b*c - a*d)*x/(b*d)) + 2*I*A*B*a^2*c*g^2*n*(a*log(b*x + a)/b - c*log(d*x
 + c)/d) + 2*I*A*B*a^2*c*g^2*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + I*A
^2*a^2*c*g^2*x - 1/12*(2*I*a^3*c*d^3*g^2*n^2 + (I*n^2 + 2*I*n)*b^3*c^4*g^2
 - 2*(I*n^2 + 4*I*n)*a*b^2*c^3*d*g^2 + (-I*n^2 + 12*I*n)*a^2*b*c^2*d^2*g^2)*
B^2*log(d*x + c)/(b*d^3) - 1/6*(I*b^4*c^4*g^2*n^2 - 4*I*a*b^3*c^3*d*g^2*n^2
 + 6*I*a^2*b^2*c^2*d^2*g^2*n^2 - 4*I*a^3*b*c*d^3*g^2*n^2 + I*a^4*d^4*g^2*n^
2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/
(b*c - a*d)))*B^2/(b^2*d^3) + 1/12*(3*I*B^2*b^4*d^4*g^2*x^4 - 2*(b^4*c*d^3*
g^2*(I*n - 2*I) + a*b^3*d^4*g^2*(-I*n - 4*I))*B^2*x^3 + ((I*n^2 - I*n)*b^4*
c^2*d^2*g^2 - 2*(I*n^2 + 2*I*n - 6*I)*a*b^3*c*d^3*g^2 + (I*n^2 + 5*I*n + 6*
I)*a^2*b^2*d^4*g^2)*B^2*x^2 + (-4*I*a^3*b*c*d^3*g^2*n^2 + I*a^4*d^4*g^2*n^2
)*B^2*log(b*x + a)^2 - 2*(-I*b^4*c^4*g^2*n^2 + 4*I*a*b^3*c^3*d*g^2*n^2 - 6*
I*a^2*b^2*c^2*d^2*g^2*n^2)*B^2*log(b*x + a)*log(d*x + c) + (-I*b^4*c^4*g^2*
n^2 + 4*I*a*b^3*c^3*d*g^2*n^2 - 6*I*a^2*b^2*c^2*d^2*g^2*n^2)*B^2*log(d*x +
c)^2 + ((-I*n^2 + 2*I*n)*b^4*c^3*d*g^2 + (5*I*n^2 - 8*I*n)*a*b^3*c^2*d^2*g^
2 + (-7*I*n^2 + 4*I*n + 12*I)*a^2*b^2*c*d^3*g^2 + (3*I*n^2 + 2*I*n)*a^3*b*d
^4*g^2)*B^2*x + (2*I*a*b^3*c^3*d*g^2*n^2 - 7*I*a^2*b^2*c^2*d^2*g^2*n^2 - 2*
(-3*I*n^2 - 4*I*n)*a^3*b*c*d^3*g^2 + (-I*n^2 - 2*I*n)*a^4*d^4*g^2)*B^2*log(
b*x + a) + (3*I*B^2*b^4*d^4*g^2*x^4 + 12*I*B^2*a^2*b^2*c*d^3*g^2*x - 4*(-I*
b^4*c*d^3*g^2 - 2*I*a*b^3*d^4*g^2)*B^2*x^3 - 6*(-2*I*a*b^3*c*d^3*g^2 - I*a^
2*b^2*d^4*g^2)*B^2*x^2)*log((b*x + a)^n)^2 + (3*I*B^2*b^4*d^4*g^2*x^4 + 12*
I*B^2*a^2*b^2*c*d^3*g^2*x - 4*(-I*b^4*c*d^3*g^2 - 2*I*a*b^3*d^4*g^2)*B^2*x^
3 - 6*(-2*I*a*b^3*c*d^3*g^2 - I*a^2*b^2*d^4*g^2)*B^2*x^2)*log((d*x + c)^n)^
2 + (6*I*B^2*b^4*d^4*g^2*x^4 - 2*(b^4*c*d^3*g^2*(I*n - 4*I) + a*b^3*d^4*g^2
*(-I*n - 8*I))*B^2*x^3 + (-I*b^4*c^2*d^2*g^2*n + a^2*b^2*d^4*g^2*(5*I*n + 1
2*I) - 4*a*b^3*c*d^3*g^2*(I*n - 6*I))*B^2*x^2 - 2*(-I*b^4*c^3*d*g^2*n + 4*I
*a*b^3*c^2*d^2*g^2*n - I*a^3*b*d^4*g^2*n + 2*a^2*b^2*c*d^3*g^2*(-I*n - 6*I)
)*B^2*x - 2*(-4*I*a^3*b*c*d^3*g^2*n + I*a^4*d^4*g^2*n)*B^2*log(b*x + a) - 2
*(I*b^4*c^4*g^2*n - 4*I*a*b^3*c^3*d*g^2*n + 6*I*a^2*b^2*c^2*d^2*g^2*n)*B^2*
log(d*x + c))*log((b*x + a)^n) + (-6*I*B^2*b^4*d^4*g^2*x^4 - 2*(a*b^3*d^4*g
^2*(I*n + 8*I) + b^4*c*d^3*g^2*(-I*n + 4*I))*B^2*x^3 + (I*b^4*c^2*d^2*g^2*n
 - 4*a*b^3*c*d^3*g^2*(-I*n + 6*I) + a^2*b^2*d^4*g^2*(-5*I*n - 12*I))*B^2*x^
2 - 2*(I*b^4*c^3*d*g^2*n - 4*I*a*b^3*c^2*d^2*g^2*n + I*a^3*b*d^4*g^2*n + 2*
a^2*b^2*c*d^3*g^2*(I*n + 6*I))*B^2*x - 2*(4*I*a^3*b*c*d^3*g^2*n - I*a^4*d^4
*g^2*n)*B^2*log(b*x + a) - 2*(-I*b^4*c^4*g^2*n + 4*I*a*b^3*c^3*d*g^2*n - 6*
I*a^2*b^2*c^2*d^2*g^2*n)*B^2*log(d*x + c) - 2*(3*I*B^2*b^4*d^4*g^2*x^4 + 12
*I*B^2*a^2*b^2*c*d^3*g^2*x + 4*(I*b^4*c*d^3*g^2 + 2*I*a*b^3*d^4*g^2)*B^2*x^
3 + 6*(2*I*a*b^3*c*d^3*g^2 + I*a^2*b^2*d^4*g^2)*B^2*x^2)*log((b*x + a)^n))*

```
log((d*x + c)^n))/(b^2*d^3)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

$$\text{could not integrate}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="fricas")
```

```
[Out] 1/12*(3*I*B^2*b^2*d*g^2*n^2*x^4 + 12*I*B^2*a^2*c*g^2*n^2*x - 4*(-I*B^2*b^2*
c - 2*I*B^2*a*b*d)*g^2*n^2*x^3 - 6*(-2*I*B^2*a*b*c - I*B^2*a^2*d)*g^2*n^2*x
^2)*log((b*x + a)/(d*x + c))^2 + integral(-1/6*(6*(-I*A^2 - 2*I*A*B - I*B^2
)*b^3*d^2*g^2*x^5 + 6*(-I*A^2 - 2*I*A*B - I*B^2)*a^3*c^2*g^2 + 6*(2*(-I*A^2
 - 2*I*A*B - I*B^2)*b^3*c*d + 3*(-I*A^2 - 2*I*A*B - I*B^2)*a*b^2*d^2)*g^2*x
^4 + 6*((-I*A^2 - 2*I*A*B - I*B^2)*b^3*c^2 + 6*(-I*A^2 - 2*I*A*B - I*B^2)*a
*b^2*c*d + 3*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b*d^2)*g^2*x^3 + 6*(3*(-I*A^2 -
 2*I*A*B - I*B^2)*a*b^2*c^2 + 6*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b*c*d + (-I*
A^2 - 2*I*A*B - I*B^2)*a^3*d^2)*g^2*x^2 + 6*(3*(-I*A^2 - 2*I*A*B - I*B^2)*a
^2*b*c^2 + 2*(-I*A^2 - 2*I*A*B - I*B^2)*a^3*c*d)*g^2*x + (12*(-I*A*B - I*B^
2)*b^3*d^2*g^2*n*x^5 + 12*(-I*A*B - I*B^2)*a^3*c^2*g^2*n + 3*((I*B^2*b^3*c*
d - I*B^2*a*b^2*d^2)*g^2*n^2 + 4*(2*(-I*A*B - I*B^2)*b^3*c*d + 3*(-I*A*B -
I*B^2)*a*b^2*d^2)*g^2*n)*x^4 + 4*((I*B^2*b^3*c^2 + I*B^2*a*b^2*c*d - 2*I*B^
2*a^2*b*d^2)*g^2*n^2 + 3*((-I*A*B - I*B^2)*b^3*c^2 + 6*(-I*A*B - I*B^2)*a*b
^2*c*d + 3*(-I*A*B - I*B^2)*a^2*b*d^2)*g^2*n)*x^3 + 6*((2*I*B^2*a*b^2*c^2 -
 I*B^2*a^2*b*c*d - I*B^2*a^3*d^2)*g^2*n^2 + 2*(3*(-I*A*B - I*B^2)*a*b^2*c^2
 + 6*(-I*A*B - I*B^2)*a^2*b*c*d + (-I*A*B - I*B^2)*a^3*d^2)*g^2*n)*x^2 + 12
*((I*B^2*a^2*b*c^2 - I*B^2*a^3*c*d)*g^2*n^2 + (3*(-I*A*B - I*B^2)*a^2*b*c^2
 + 2*(-I*A*B - I*B^2)*a^3*c*d)*g^2*n)*x)*log((b*x + a)/(d*x + c)))/(b*d*x^2
 + a*c + (b*c + a*d)*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$g^{2} i \left(\int A^{2} a^{2} c\, dx + \int A^{2} a^{2} d x\, dx + \int A^{2} b^{2} c x^{2}\, dx + \int A^{2} b^{2} d x^{3}\, dx + \int B^{2} a^{2} c \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}^{2}\, dx + \int 2 A B a^{2} c \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}\, dx + \int 2 A^{2} a b c x\, dx + \int 2 A^{2} a b d x^{2}\, dx + \int B^{2} a^{2} d x \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}^{2}\, dx + \int B^{2} b^{2} c x^{2} \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}^{2}\, dx + \int B^{2} b^{2} d x^{3} \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}^{2}\, dx + \int 2 A B a^{2} d x \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}\, dx + \int 2 A B b^{2} c x^{2} \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}\, dx + \int 2 A B b^{2} d x^{3} \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}\, dx + \int 2 B^{2} a b c x \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}^{2}\, dx + \int 2 B^{2} a b d x^{2} \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}^{2}\, dx + \int 4 A B a b c x \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}\, dx + \int 4 A B a b d x^{2} \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] g**2*i*(Integral(A**2*a**2*c, x) + Integral(A**2*a**2*d*x, x) + Integral(A*
*2*b**2*c*x**2, x) + Integral(A**2*b**2*d*x**3, x) + Integral(B**2*a**2*c*l
og(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(2*A*B*a**2*c*log(e
*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral(2*A**2*a*b*c*x, x) + Inte
gral(2*A**2*a*b*d*x**2, x) + Integral(B**2*a**2*d*x*log(e*(a/(c + d*x) + b*
x/(c + d*x))**n)**2, x) + Integral(B**2*b**2*c*x**2*log(e*(a/(c + d*x) + b*
```

```
x/(c + d*x))**n)**2, x) + Integral(B**2*b**2*d*x**3*log(e*(a/(c + d*x) + b*
x/(c + d*x))**n)**2, x) + Integral(2*A*B*a**2*d*x*log(e*(a/(c + d*x) + b*x/
(c + d*x))**n), x) + Integral(2*A*B*b**2*c*x**2*log(e*(a/(c + d*x) + b*x/(c
 + d*x))**n), x) + Integral(2*A*B*b**2*d*x**3*log(e*(a/(c + d*x) + b*x/(c +
 d*x))**n), x) + Integral(2*B**2*a*b*c*x*log(e*(a/(c + d*x) + b*x/(c + d*x)
)**n)**2, x) + Integral(2*B**2*a*b*d*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x
))**n)**2, x) + Integral(4*A*B*a*b*c*x*log(e*(a/(c + d*x) + b*x/(c + d*x))*
*n), x) + Integral(4*A*B*a*b*d*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)
, x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(I*d*x + I*c)*(B*log(((b*x + a)/(d*x + c))^n*e) +
 A)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(a\,g+b\,g\,x\right)}^2\,\left(c\,i+d\,i\,x\right)\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,
x)
```

```
[Out] int((a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,
 x)
```

3.161 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=372

$$\frac{B^2(bc-ad)^2 gin^2 x}{3bd}-\frac{B(bc-ad)^2 gin(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2d}-\frac{B(bc-ad)gin(a+bx)^2\left(A+B\log\right.}{3b^2}$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*g*i*n^2*x/b/d-1/3*B*(-a*d+b*c)^2*g*i*n*(b*x+a)*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))/b^2/d-1/3*B*(-a*d+b*c)*g*i*n*(b*x+a)^2*(A+B*ln(e*(
(b*x+a)/(d*x+c))^n))/b^2+1/6*(-a*d+b*c)*g*i*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d
*x+c))^n))^2/b^2+1/3*g*i*(b*x+a)^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^
2/b-1/3*B*(-a*d+b*c)^3*g*i*n*(A+B*n+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b
*c)/b/(d*x+c))/b^2/d^2-1/3*B^2*(-a*d+b*c)^3*g*i*n^2*ln(d*x+c)/b^2/d^2-1/3*B
^2*(-a*d+b*c)^3*g*i*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^2/d^2
```

Rubi [A]
time = 0.25, antiderivative size = 372, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.195$, Rules used = {2561, 2383, 2381, 2384, 2354, 2438, 2373, 45}

$$-\frac{B^2gin^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b^2d^2}-\frac{Bgin(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A+Bn\right)}{3b^2d^2}-\frac{Bgin(a+bx)(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^2d}+\frac{gi(a+bx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{6b^2}-\frac{Bgin(a+bx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^2}+\frac{gi(a+bx)^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3b}-\frac{B^2gin^2(bc-ad)^3\log(c+dx)}{3b^2d^2}+\frac{B^2gin^2x(bc-ad)^2}{3bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (B^2*(b*c - a*d)^2*g*i*n^2*x)/(3*b*d) - (B*(b*c - a*d)^2*g*i*n*(a + b*x)*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2*d) - (B*(b*c - a*d)*g*i*n*(a +
 b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2) + ((b*c - a*d)*g*i*
(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(6*b^2) + (g*i*(a + b
*x)^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b) - (B*(b*c -
 a*d)^3*g*i*n*(A + B*n + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/
(b*(c + d*x))])/(3*b^2*d^2) - (B^2*(b*c - a*d)^3*g*i*n^2*Log[c + d*x])/(3*b
^2*d^2) - (B^2*(b*c - a*d)^3*g*i*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
])/(3*b^2*d^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
```

```
Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (161c+161dx)(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(161acg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.\right.$$

$$= (161acg)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.$$

$$= 161acgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 -$$

$$= 161acgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 -$$

$$= 161acgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 -$$

$$= 161acgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 -$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} - \frac{161}{3}B$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} - \frac{161B}{}$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} - \frac{161B}{}$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} + \frac{161B}{}$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} + \frac{161B}{}$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} + \frac{161B}{}$$

Mathematica [**B**] Leaf count is larger than twice the leaf count of optimal. 937 vs. 2(372) = 744.

time = 0.50, size = 937, normalized size = 2.52

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2,x]
```

```
[Out] (g*i*(-6*A*b^2*B*c*d*(b*c - a*d)*n*x + 6*a*A*b*B*d^2*(-(b*c) + a*d)*n*x + 4
*A*b*B*d*(b*c - a*d)*(b*c + a*d)*n*x - 6*b*B^2*c*d*(b*c - a*d)*n*(a + b*x)*
Log[e*((a + b*x)/(c + d*x))^n] + 6*a*B^2*d^2*(-(b*c) + a*d)*n*(a + b*x)*Log
[e*((a + b*x)/(c + d*x))^n] + 4*B^2*d*(b*c - a*d)*(b*c + a*d)*n*(a + b*x)*L
og[e*((a + b*x)/(c + d*x))^n] - 2*b^2*B*d^2*(b*c - a*d)*n*x^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]) + 6*a^2*b*B*c*d^2*n*Log[a + b*x]*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]) - 2*a^3*B*d^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]) + 6*a*b^2*c*d^2*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
+ 3*b^2*d^2*(b*c + a*d)*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 2*b^
3*d^3*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 6*b*B^2*c*(b*c - a*d)^
2*n^2*Log[c + d*x] + 6*a*B^2*d*(b*c - a*d)^2*n^2*Log[c + d*x] - 4*B^2*(b*c
- a*d)^2*(b*c + a*d)*n^2*Log[c + d*x] + 2*b^3*B*c^3*n*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])*Log[c + d*x] - 6*a*b^2*B*c^2*d*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])*Log[c + d*x] + 2*B^2*(b*c - a*d)*n^2*(a^2*d^2*Log[a + b*x] -
 b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*a^2*b*B^2*c*d^2*n^2*(Log[
a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (
d*(a + b*x))/(-(b*c) + a*d)]) + a^3*B^2*d^3*n^2*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) - b^3*B^2*c^3*n^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d
*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 3*a*b^2*B^2*
c^2*d*n^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(6*b^2*d^2)
```

Maple [F]
time = 0.08, size = 0, normalized size = 0.00

$$\int (bgx + ag)\,(dix + ci)\left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1419 vs. 2(352) = 704.
time = 0.84, size = 1419, normalized size = 3.81

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, alg
orithm="maxima")
```

```
[Out] 2/3*I*A*B*b*d*g*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/3*I*A^2*b*d*
g*x^3 + I*A*B*b*c*g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + I*A*B*a*d*
g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/2*I*A^2*b*c*g*x^2 + 1/2*I*
A^2*a*d*g*x^2 + 1/3*I*A*B*b*d*g*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x +
 c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) -
I*A*B*b*c*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/
(b*d)) - I*A*B*a*d*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c
- a*d)*x/(b*d)) + 2*I*A*B*a*c*g*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2
*I*A*B*a*c*g*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + I*A^2*a*c*g*x - 1/3
*(I*a^2*c*d^2*g*n^2 + (-I*n^2 + 3*I*n)*a*b*c^2*d*g - I*b^2*c^3*g*n)*B^2*log
(d*x + c)/(b*d^2) - 1/3*(-I*b^3*c^3*g*n^2 + 3*I*a*b^2*c^2*d*g*n^2 - 3*I*a^2
*b*c*d^2*g*n^2 + I*a^3*d^3*g*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*
d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^2) + 1/6*(2*I*B^2*b
^3*d^3*g*x^3 + (a*b^2*d^3*g*(2*I*n + 3*I) + b^3*c*d^2*g*(-2*I*n + 3*I))*B^2
*x^2 + (-3*I*a^2*b*c*d^2*g*n^2 + I*a^3*d^3*g*n^2)*B^2*log(b*x + a)^2 - 2*(I
*b^3*c^3*g*n^2 - 3*I*a*b^2*c^2*d*g*n^2)*B^2*log(b*x + a)*log(d*x + c) + (I*
b^3*c^3*g*n^2 - 3*I*a*b^2*c^2*d*g*n^2)*B^2*log(d*x + c)^2 - 2*((-I*n^2 + I*
n)*b^3*c^2*d*g + (2*I*n^2 - 3*I)*a*b^2*c*d^2*g + (-I*n^2 - I*n)*a^2*b*d^3*g
)*B^2*x - 2*(I*a*b^2*c^2*d*g*n^2 + (-I*n^2 - 3*I*n)*a^2*b*c*d^2*g + I*a^3*d
^3*g*n)*B^2*log(b*x + a) + (2*I*B^2*b^3*d^3*g*x^3 + 6*I*B^2*a*b^2*c*d^2*g*x
 - 3*(-I*b^3*c*d^2*g - I*a*b^2*d^3*g)*B^2*x^2)*log((b*x + a)^n)^2 + (2*I*B^
2*b^3*d^3*g*x^3 + 6*I*B^2*a*b^2*c*d^2*g*x - 3*(-I*b^3*c*d^2*g - I*a*b^2*d^3
*g)*B^2*x^2)*log((d*x + c)^n)^2 - 2*(-2*I*B^2*b^3*d^3*g*x^3 + (b^3*c*d^2*g*
(I*n - 3*I) + a*b^2*d^3*g*(-I*n - 3*I))*B^2*x^2 + (I*b^3*c^2*d*g*n - I*a^2*
b*d^3*g*n - 6*I*a*b^2*c*d^2*g)*B^2*x + (-3*I*a^2*b*c*d^2*g*n + I*a^3*d^3*g*
n)*B^2*log(b*x + a) + (-I*b^3*c^3*g*n + 3*I*a*b^2*c^2*d*g*n)*B^2*log(d*x +
c))*log((b*x + a)^n) - 2*(2*I*B^2*b^3*d^3*g*x^3 + (a*b^2*d^3*g*(I*n + 3*I)
+ b^3*c*d^2*g*(-I*n + 3*I))*B^2*x^2 + (-I*b^3*c^2*d*g*n + I*a^2*b*d^3*g*n +
 6*I*a*b^2*c*d^2*g)*B^2*x + (3*I*a^2*b*c*d^2*g*n - I*a^3*d^3*g*n)*B^2*log(b
*x + a) + (I*b^3*c^3*g*n - 3*I*a*b^2*c^2*d*g*n)*B^2*log(d*x + c) + (2*I*B^2
*b^3*d^3*g*x^3 + 6*I*B^2*a*b^2*c*d^2*g*x + 3*(I*b^3*c*d^2*g + I*a*b^2*d^3*g
)*B^2*x^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d^2)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, alg
orithm="fricas")
```

```
[Out] 1/6*(2*I*B^2*b*d*g*n^2*x^3 + 6*I*B^2*a*c*g*n^2*x - 3*(-I*B^2*b*c - I*B^2*a*
d)*g*n^2*x^2)*log((b*x + a)/(d*x + c))^2 + integral(-1/3*(3*(-I*A^2 - 2*I*A
*B - I*B^2)*b^2*d^2*g*x^4 + 3*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*c^2*g + 6*((-I
*A^2 - 2*I*A*B - I*B^2)*b^2*c*d + (-I*A^2 - 2*I*A*B - I*B^2)*a*b*d^2)*g*x^3
 + 3*((-I*A^2 - 2*I*A*B - I*B^2)*b^2*c^2 + 4*(-I*A^2 - 2*I*A*B - I*B^2)*a*b
*c*d + (-I*A^2 - 2*I*A*B - I*B^2)*a^2*d^2)*g*x^2 + 6*((-I*A^2 - 2*I*A*B - I
*B^2)*a*b*c^2 + (-I*A^2 - 2*I*A*B - I*B^2)*a^2*c*d)*g*x + (6*(-I*A*B - I*B^
2)*b^2*d^2*g*n*x^4 + 6*(-I*A*B - I*B^2)*a^2*c^2*g*n + 2*((I*B^2*b^2*c*d - I
*B^2*a*b*d^2)*g*n^2 + 6*((-I*A*B - I*B^2)*b^2*c*d + (-I*A*B - I*B^2)*a*b*d^
2)*g*n)*x^3 + 3*((I*B^2*b^2*c^2 - I*B^2*a^2*d^2)*g*n^2 + 2*((-I*A*B - I*B^2
)*b^2*c^2 + 4*(-I*A*B - I*B^2)*a*b*c*d + (-I*A*B - I*B^2)*a^2*d^2)*g*n)*x^2
 + 6*((I*B^2*a*b*c^2 - I*B^2*a^2*c*d)*g*n^2 + 2*((-I*A*B - I*B^2)*a*b*c^2 +
 (-I*A*B - I*B^2)*a^2*c*d)*g*n)*x)*log((b*x + a)/(d*x + c)))/(b*d*x^2 + a*c
 + (b*c + a*d)*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$gi\left(\int A^2ac\,dx + \int A^2adx\,dx + \int A^2bcx\,dx + \int A^2bdx^2\,dx + \int B^2ac\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx + \int 2ABac\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx + \int B^2adx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx + \int B^2bcx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx + \int B^2bdx^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx + \int 2ABadx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx + \int 2ABbcx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx + \int 2ABbdx^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] g*i*(Integral(A**2*a*c, x) + Integral(A**2*a*d*x, x) + Integral(A**2*b*c*x,
 x) + Integral(A**2*b*d*x**2, x) + Integral(B**2*a*c*log(e*(a/(c + d*x) + b
*x/(c + d*x))**n)**2, x) + Integral(2*A*B*a*c*log(e*(a/(c + d*x) + b*x/(c +
 d*x))**n), x) + Integral(B**2*a*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n
)**2, x) + Integral(B**2*b*c*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2,
x) + Integral(B**2*b*d*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x)
+ Integral(2*A*B*a*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integr
al(2*A*B*b*c*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral(2*A*B
*b*d*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(I*d*x + I*c)*(B*log(((b*x + a)/(d*x + c))^n*e) + A
)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)\,\left(c\,i+d\,i\,x\right)\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
[Out] int((a*g + b*g*x)*(c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x
)
```

3.162 $\int (ci+dix) \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=220

$$-\frac{B(bc-ad)in(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2}+\frac{i(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2d}+\frac{B^2(bc-ad)^2in^2\log(c}{b^2d}$$

```
[Out] -B*(-a*d+b*c)*i*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2+1/2*i*(d*x+c)
^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d+B^2*(-a*d+b*c)^2*i*n^2*ln(d*x+c)/b^2
/d+B*(-a*d+b*c)^2*i*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x
+a))/b^2/d-B^2*(-a*d+b*c)^2*i*n^2*polylog(2,b*(d*x+c)/d/(b*x+a))/b^2/d
```

Rubi [A]
time = 0.16, antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.212$, Rules used = {2551, 2356, 2389, 2379, 2438, 2351, 31}

$$-\frac{B^2in^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2d}+\frac{Bin(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2d}-\frac{Bin(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2}+\frac{i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2d}+\frac{B^2in^2(bc-ad)^2\log(c+dx)}{b^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -((B*(b*c - a*d)*i*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/b^2)
 + (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d) + (B^2*(b
*c - a*d)^2*i*n^2*Log[c + d*x])/(b^2*d) + (B*(b*c - a*d)^2*i*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*d) -
(B^2*(b*c - a*d)^2*i*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
```

```
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2551

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(m +
1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c -
 a*d, 0] && IntegersQ[m, p] && EqQ[d*f - c*g, 0] && (GtQ[p, 0] || LtQ[m, -1
])
```

Rubi steps

$$\int (162c+162dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx = \frac{81(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(Bn)\int \frac{26244(}{}}{}$$

$$= \frac{81(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(162B(bc-}{}$$

$$= \frac{81(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(162B(bc-}{}$$

$$= \frac{81(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(162B(bc-}{}$$

$$= -\frac{162AB(bc-ad)nx}{b} - \frac{162B(bc-ad)^2n\log(a+bx}{b^2d}$$

$$= -\frac{162AB(bc-ad)nx}{b} - \frac{162B^2(bc-ad)n(a+bx)\log}{b^2}$$

$$= -\frac{162AB(bc-ad)nx}{b} - \frac{162B^2(bc-ad)n(a+bx)\log}{b^2}$$

$$= -\frac{162AB(bc-ad)nx}{b} - \frac{162B^2(bc-ad)n(a+bx)\log}{b^2}$$

$$= -\frac{162AB(bc-ad)nx}{b} + \frac{81B^2(bc-ad)^2n^2\log^2(a+b}{b^2d}$$

$$= -\frac{162AB(bc-ad)nx}{b} + \frac{81B^2(bc-ad)^2n^2\log^2(a+b}{b^2d}$$

Mathematica [A]

time = 0.14, size = 216, normalized size = 0.98

$$\frac{i\left((c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2+\frac{B(bc-ad)n\left(B(bc-ad)n\log^2(a+bx)-2\left(Abdx+Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+B(-bc+ad)n\log(c+dx)\right)-2(bc-ad)\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2B(-bc+ad)n\operatorname{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)}{b^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (i*((c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*(b*c - a*d)*n
*(B*(b*c - a*d)*n*Log[a + b*x]^2 - 2*(A*b*d*x + B*d*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] + B*(-(b*c) + a*d)*n*Log[c + d*x]) - 2*(b*c - a*d)*Log[a
+ b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(b*(c + d*x))/(b*c -
```

```
 a*d)]) + 2*B*(-(b*c) + a*d)*n*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/b
^2))/(2*d)
```

Maple [F]
time = 0.07, size = 0, normalized size = 0.00

$$\int (dix + ci) \left(A + B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 768 vs. 2(217) = 434.
time = 0.79, size = 768, normalized size = 3.49

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] I*A*B*d*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/2*I*A^2*d*x^2 - I*A*
B*d*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) +
 2*I*A*B*c*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*I*A*B*c*x*log((b*x/(
d*x + c) + a/(d*x + c))^n*e) + I*A^2*c*x - (I*a*c*d*n^2 + (-I*n^2 + I*n)*b*
c^2)*B^2*log(d*x + c)/(b*d) - (I*b^2*c^2*n^2 - 2*I*a*b*c*d*n^2 + I*a^2*d^2*
n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d
)/(b*c - a*d)))*B^2/(b^2*d) + 1/2*(2*I*B^2*b^2*c^2*n^2*log(b*x + a)*log(d*x
 + c) - I*B^2*b^2*c^2*n^2*log(d*x + c)^2 + I*B^2*b^2*d^2*x^2 + (-2*I*a*b*c*
d*n^2 + I*a^2*d^2*n^2)*B^2*log(b*x + a)^2 - 2*(-I*a*b*d^2*n + b^2*c*d*(I*n
- I))*B^2*x - 2*((I*n^2 - 2*I*n)*a*b*c*d + (-I*n^2 + I*n)*a^2*d^2)*B^2*log(
b*x + a) + (I*B^2*b^2*d^2*x^2 + 2*I*B^2*b^2*c*d*x)*log((b*x + a)^n)^2 + (I*
B^2*b^2*d^2*x^2 + 2*I*B^2*b^2*c*d*x)*log((d*x + c)^n)^2 - 2*(-I*B^2*b^2*d^2
*x^2 + I*B^2*b^2*c^2*n*log(d*x + c) + (-I*a*b*d^2*n + b^2*c*d*(I*n - 2*I))*
B^2*x + (-2*I*a*b*c*d*n + I*a^2*d^2*n)*B^2*log(b*x + a))*log((b*x + a)^n) -
 2*(I*B^2*b^2*d^2*x^2 - I*B^2*b^2*c^2*n*log(d*x + c) + (I*a*b*d^2*n + b^2*c
*d*(-I*n + 2*I))*B^2*x + (2*I*a*b*c*d*n - I*a^2*d^2*n)*B^2*log(b*x + a) + (
I*B^2*b^2*d^2*x^2 + 2*I*B^2*b^2*c*d*x)*log((b*x + a)^n))*log((d*x + c)^n))/
(b^2*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] 1/2*(I*B^2*d*n^2*x^2 + 2*I*B^2*c*n^2*x)*log((b*x + a)/(d*x + c))^2 + integr
al(((I*A^2 + 2*I*A*B + I*B^2)*b*d^2*x^3 + (I*A^2 + 2*I*A*B + I*B^2)*a*c^2 -
 (2*(-I*A^2 - 2*I*A*B - I*B^2)*b*c*d - (I*A^2 + 2*I*A*B + I*B^2)*a*d^2)*x^2
 + ((I*A^2 + 2*I*A*B + I*B^2)*b*c^2 - 2*(-I*A^2 - 2*I*A*B - I*B^2)*a*c*d)*x
 - (2*(-I*A*B - I*B^2)*b*d^2*n*x^3 + 2*(-I*A*B - I*B^2)*a*c^2*n - ((-I*B^2*
b*c*d + I*B^2*a*d^2)*n^2 - 2*(2*(-I*A*B - I*B^2)*b*c*d + (-I*A*B - I*B^2)*a
*d^2)*n)*x^2 + 2*((I*B^2*b*c^2 - I*B^2*a*c*d)*n^2 + ((-I*A*B - I*B^2)*b*c^2
 + 2*(-I*A*B - I*B^2)*a*c*d)*n)*x)*log((b*x + a)/(d*x + c)))/(b*d*x^2 + a*c
 + (b*c + a*d)*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$i\left(\int A^{2}c\,dx+\int A^{2}dx\,dx+\int B^{2}c\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)^{2}dx+\int 2ABc\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)dx+\int B^{2}dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)^{2}dx+\int 2ABdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] i*(Integral(A**2*c, x) + Integral(A**2*d*x, x) + Integral(B**2*c*log(e*(a/(
c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(2*A*B*c*log(e*(a/(c + d*x)
+ b*x/(c + d*x))**n), x) + Integral(B**2*d*x*log(e*(a/(c + d*x) + b*x/(c +
d*x))**n)**2, x) + Integral(2*A*B*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**
n), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] integrate((I*d*x + I*c)*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (c\,i+d\,i\,x)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

3.163 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=306

$$\frac{di(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g}+\frac{2B(bc-ad)in\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)}{b^2g}-\frac{(bc-ad)i(A+$$

```
[Out] d*i*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^2/g+2*B*(-a*d+b*c)*i*n*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/b^2/g-(-a*d+b*c)*i*(A+
B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^2/g+2*B^2*(-a*d+
b*c)*i*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^2/g+2*B*(-a*d+b*c)*i*n*(A+B*ln(
e*((b*x+a)/(d*x+c))^n))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^2/g+2*B^2*(-a*d+b*
c)*i*n^2*polylog(3,b*(d*x+c)/d/(b*x+a))/b^2/g
```

Rubi [A]
time = 0.27, antiderivative size = 306, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.186$, Rules used = {2561, 2389, 2379, 2421, 6724, 2355, 2354, 2438}

$$\frac{2Bin(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g}+\frac{2B^2in^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^2g}+\frac{2B^2in^2(bc-ad)\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g}+\frac{2Bin(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g}+\frac{di(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^2g}-\frac{i(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x),
x]
```

```
[Out] (d*i*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g) + (2*B*(b*
c - a*d)*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c +
 d*x))])/(b^2*g) - ((b*c - a*d)*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*
Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g) + (2*B^2*(b*c - a*d)*i*n^2*Po
lyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^2*g) + (2*B*(b*c - a*d)*i*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/
(b^2*g) + (2*B^2*(b*c - a*d)*i*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])
/(b^2*g)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
```

```
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(163c+163dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{163d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg} + \frac{163(bc-ad)\left(A+\right.}{bg(a+}\right.$$

$$= \frac{(163d)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx}{bg} + \frac{(163(bc-ad))\int}{}$$

$$= \frac{163dx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg} + \frac{163(bc-ad)\log(a+bx}{}$$

$$= \frac{163dx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg} + \frac{163(bc-ad)\log(a+bx}{}$$

$$= \frac{163dx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg} + \frac{163(bc-ad)\log(a+bx}{}$$

$$= \frac{163dx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg} + \frac{163(bc-ad)\log(a+bx}{}$$

$$= \frac{326aBdn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g} + \frac{163dx(A}{}$$

$$= -\frac{163B^2(bc-ad)\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g} + \frac{326aBdn}{}$$

$$= -\frac{163B^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g} - \frac{163B}{}$$

$$= -\frac{163AB(bc-ad)n\log^2(a+bx)}{b^2g} - \frac{163B^2(bc-ad)\log\left(\right.}{}$$

$$= -\frac{163AB(bc-ad)n\log^2(a+bx)}{b^2g} - \frac{163aB^2dn^2\log^2(a+b}{b^2g}$$

$$= -\frac{163AB(bc-ad)n\log^2(a+bx)}{b^2g} - \frac{163aB^2dn^2\log^2(a+b}{b^2g}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 742 vs. 2(306) = 612.

time = 1.17, size = 742, normalized size = 2.42

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x),x]
```

```
[Out] (i*(3*b*d*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c +
d*x)])^2 + 3*(b*c - a*d)*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
 - B*n*Log[(a + b*x)/(c + d*x)])^2 - 3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x
))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(a*d*Log[a/b + x]^2 - 2*a*d*Log[a/b +
 x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*(b*c + a*d*Log[a +
b*x] - a*d*Log[(d*(a + b*x))/(-(b*c) + a*d)]) + (-(b*d*x) + a*d*Log[a + b*x
])*Log[(a + b*x)/(c + d*x)]) - 2*a*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
 + 3*b*B*c*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c +
 d*x)])*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Log[a/b + x] - Log[c/d + x] - Log
[(a + b*x)/(c + d*x)]) - 2*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)]
+ PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B^2*n^2*(Log[(a + b*x)/(c + d*x
)]*(-(a*d*Log[(a + b*x)/(c + d*x)]^2) + 6*(b*c - a*d)*Log[(b*c - a*d)/(b*c
+ b*d*x)] + 3*d*Log[(a + b*x)/(c + d*x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c
+ b*d*x)])) + 6*(b*c - a*d + a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a
 + b*x))/(b*(c + d*x))] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) -
3*b*B^2*c*n^2*(Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2
 - 2*Log[(a + b*x)/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 2*P
olyLog[3, (b*(c + d*x))/(d*(a + b*x))])))/(3*b^2*g)
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{(dix + ci)\left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{bgx + ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, alg
orithm="maxima")
```

```
[Out] I*A^2*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + I*A^2*c*log(b*g*x + a*g)/(b*g)
 - (-I*B^2*b*d*x + (-I*b*c + I*a*d)*B^2*log(b*x + a))*log((d*x + c)^n)^2/(b
```

```
^2*g) - integrate((-2*I*A*B*b^2*c^2 - I*B^2*b^2*c^2 + (-2*I*A*B*b^2*d^2 - I
*B^2*b^2*d^2)*x^2 + (-I*B^2*b^2*d^2*x^2 - 2*I*B^2*b^2*c*d*x - I*B^2*b^2*c^2
)*log((b*x + a)^n)^2 - 2*(2*I*A*B*b^2*c*d + I*B^2*b^2*c*d)*x - 2*(I*A*B*b^2
*c^2 + I*B^2*b^2*c^2 + (I*A*B*b^2*d^2 + I*B^2*b^2*d^2)*x^2 + 2*(I*A*B*b^2*c
*d + I*B^2*b^2*c*d)*x)*log((b*x + a)^n) - 2*(-I*A*B*b^2*c^2 - I*B^2*b^2*c^2
 + (B^2*b^2*d^2*(-I*n - I) - I*A*B*b^2*d^2)*x^2 + (-2*I*A*B*b^2*c*d + (-I*a
*b*d^2*n - 2*I*b^2*c*d)*B^2)*x + ((-I*b^2*c*d*n + I*a*b*d^2*n)*B^2*x + (-I*
a*b*c*d*n + I*a^2*d^2*n)*B^2)*log(b*x + a) + (-I*B^2*b^2*d^2*x^2 - 2*I*B^2*
b^2*c*d*x - I*B^2*b^2*c^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d*g*x^2
 + a*b^2*c*g + (b^3*c*g + a*b^2*d*g)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, alg
orithm="fricas")
```

```
[Out] integral(((I*A^2 + 2*I*A*B + I*B^2)*d*x + (I*B^2*d*n^2*x + I*B^2*c*n^2)*log
((b*x + a)/(d*x + c))^2 + (I*A^2 + 2*I*A*B + I*B^2)*c - 2*((-I*A*B - I*B^2)
*d*n*x + (-I*A*B - I*B^2)*c*n)*log((b*x + a)/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\left(\int \frac{A^2c}{a+bx}\,dx + \int \frac{A^2dx}{a+bx}\,dx + \int \frac{B^2c\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a+bx}\,dx + \int \frac{2ABc\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx + \int \frac{B^2dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a+bx}\,dx + \int \frac{2ABdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g),x)
```

```
[Out] i*(Integral(A**2*c/(a + b*x), x) + Integral(A**2*d*x/(a + b*x), x) + Integr
al(B**2*c*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a + b*x), x) + Integr
al(2*A*B*c*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x) + Integral
(B**2*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a + b*x), x) + Integr
al(2*A*B*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x))/g
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, alg
orithm="giac")
```

```
[Out] integrate((I*d*x + I*c)*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(b*g*x + a
*g), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x),
x)
```

```
[Out] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x),
 x)
```

3.164 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=261

$$-\frac{2B^2in^2(c+dx)}{bg^2(a+bx)}-\frac{2Bin(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^2(a+bx)}-\frac{i(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^2(a+bx)}-\frac{di\left(A+B\,\mathrm{l}\right.}{}$$

```
[Out] -2*B^2*i*n^2*(d*x+c)/b/g^2/(b*x+a)-2*B*i*n*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+
c))^n))/b/g^2/(b*x+a)-i*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b/g^2/(b*
x+a)-d*i*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^2/g^
2+2*B*d*i*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,b*(d*x+c)/d/(b*x+a))/
b^2/g^2+2*B^2*d*i*n^2*polylog(3,b*(d*x+c)/d/(b*x+a))/b^2/g^2
```

Rubi [A]
time = 0.24, antiderivative size = 261, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.163$, Rules used = {2561, 2380, 2342, 2341, 2379, 2421, 6724}

$$\frac{2BdinPolyLog\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^2}+\frac{2B^2din^2PolyLog\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2}-\frac{di\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^2g^2}-\frac{2Bin(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bg^2(a+bx)}-\frac{i(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{bg^2(a+bx)}-\frac{2B^2in^2(c+dx)}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^
2,x]
```

```
[Out] (-2*B^2*i*n^2*(c + d*x))/(b*g^2*(a + b*x)) - (2*B*i*n*(c + d*x)*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(b*g^2*(a + b*x)) - (i*(c + d*x)*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])^2)/(b*g^2*(a + b*x)) - (d*i*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (2*B*
d*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a
 + b*x))])/(b^2*g^2) + (2*B^2*d*i*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x)
)])/(b^2*g^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(164c+164dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^2(a+bx)^2} + \frac{164d(A+B}{bg}\right.$$

$$= \frac{(164d)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}dx}{bg^2} + \frac{(164(bc-ad))\int \frac{(A+B}{}}{bg^2}$$

$$= -\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2(a+bx)} + \frac{164d\log(a+b}{}$$

$$= -\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2(a+bx)} + \frac{164d\log(a+b}{}$$

$$= -\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2(a+bx)} + \frac{164d\log(a+b}{}$$

$$= -\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2(a+bx)} + \frac{164d\log(a+b}{}$$

$$= -\frac{328B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2(a+bx)} - \frac{328Bdn\log(}{}$$

$$= -\frac{164B^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g^2} - \frac{328B(bc-ad)n(}{b^2g}$$

$$= -\frac{164B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g^2} - \frac{164B^2d\log(a}{}$$

$$= -\frac{328B^2(bc-ad)n^2}{b^2g^2(a+bx)} - \frac{328B^2dn^2\log(a+bx)}{b^2g^2} - \frac{164ABd}{}$$

$$= -\frac{328B^2(bc-ad)n^2}{b^2g^2(a+bx)} - \frac{328B^2dn^2\log(a+bx)}{b^2g^2} - \frac{164ABd}{}$$

$$= -\frac{328B^2(bc-ad)n^2}{b^2g^2(a+bx)} - \frac{328B^2dn^2\log(a+bx)}{b^2g^2} - \frac{164ABd}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1556 vs. $2(261) = 522$.

time = 1.92, size = 1556, normalized size = 5.96

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x)^2,x]
```

```
[Out] (i*((-3*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*
x)/(c + d*x)])^2)/(a + b*x) + 3*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + (6*b*B*c*n*(-A - B*Log[e*((a
+ b*x)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(-(d*(a + b*x)*Log[c/d
 + x]) + d*(a + b*x)*Log[(d*(a + b*x))/(-(b*c) + a*d)] + (b*c - a*d)*(1 + L
og[(a + b*x)/(c + d*x)])))/((b*c - a*d)*(a + b*x)) + (3*b*B^2*c*n^2*(-2*b*c
 + 2*a*d - 2*d*(a + b*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*
x)] - 2*d*(a + b*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - (b*c - a*d)*Log
[(a + b*x)/(c + d*x)]^2 + 2*d*(a + b*x)*Log[c + d*x] - 2*d*(a + b*x)*Log[(a
 + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + d*(a + b*x)*(Log[a + b*
x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(a + b*x)) + 3*B*d*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[a/b +
 x]^2 - 2*Log[a/b + x]*Log[a + b*x] - 2*Log[c/d + x]*Log[(d*(a + b*x))/(-(b
*c) + a*d)] + 2*Log[a + b*x]*((a*d)/(b*c - a*d) + Log[c/d + x] + Log[(a + b
*x)/(c + d*x)]) + 2*a*((a + b*x)^(-1) + Log[(a + b*x)/(c + d*x)]/(a + b*x)
+ (d*Log[c + d*x])/(-(b*c) + a*d)) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
]) + (B^2*d*n^2*(6*b*c - 6*a*d - (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a + b
*x) + 6*a*d*Log[a/b + x] + 3*b*c*Log[a/b + x]^2 - 3*a*d*Log[a/b + x]^2 - 6*
b*c*Log[c/d + x] + 6*b*c*Log[a + b*x] - 6*a*d*Log[a + b*x] - 6*b*c*Log[a/b
+ x]*Log[a + b*x] + 6*a*d*Log[a/b + x]*Log[a + b*x] + 6*b*c*Log[c/d + x]*Lo
g[a + b*x] - 6*a*d*Log[c/d + x]*Log[a + b*x] - 6*b*c*Log[c/d + x]*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] + 6*a*d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - (6*b*(b*c - a*d)*x*Log[(a + b*x)/(c + d*x)])/(a + b*x) + 6*b*c*Log[a
 + b*x]*Log[(a + b*x)/(c + d*x)] - 6*a*d*Log[a + b*x]*Log[(a + b*x)/(c + d*
x)] + 3*a*d*Log[(a + b*x)/(c + d*x)]^2 + 3*b*d*x*Log[(a + b*x)/(c + d*x)]^2
 - (3*b^2*x*(c + d*x)*Log[(a + b*x)/(c + d*x)]^2)/(a + b*x) - 3*b*c*Log[(-(
b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - a*d*Log[(a + b*x)/(
c + d*x)]^3 + 6*b*c*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)]
 - 6*a*d*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*a*d*Lo
g[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*(b*c - a*d + a*
d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*(b*
c - a*d)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 6*b*c*Log[(a + b*x)/(c + d
*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 6*a*d*PolyLog[3, (d*(a + b*x
```

```
))/(b*(c + d*x))] + 6*b*c*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))]))/(b*c -
a*d)))/(3*b^2*g^2)
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{(bgx+ag)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, a
lgorithm="maxima")
```

```
[Out] -2*I*A*B*c*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2
) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + I*A^2*d*(a/(b^3*g^2*x + a*b^2*g
^2) + log(b*x + a)/(b^2*g^2)) - 2*I*A*B*c*log((b*x/(d*x + c) + a/(d*x + c))
^n*e)/(b^2*g^2*x + a*b*g^2) - I*A^2*c/(b^2*g^2*x + a*b*g^2) + ((-I*b*c + I*
a*d)*B^2 + (I*B^2*b*d*x + I*B^2*a*d)*log(b*x + a))*log((d*x + c)^n)^2/(b^3*
g^2*x + a*b^2*g^2) - integrate((-I*B^2*b^2*c^2 + (-2*I*A*B*b^2*d^2 - I*B^2*
b^2*d^2)*x^2 + (-I*B^2*b^2*d^2*x^2 - 2*I*B^2*b^2*c*d*x - I*B^2*b^2*c^2)*log
((b*x + a)^n)^2 - 2*(I*A*B*b^2*c*d + I*B^2*b^2*c*d)*x - 2*(I*B^2*b^2*c^2 +
(I*A*B*b^2*d^2 + I*B^2*b^2*d^2)*x^2 + (I*A*B*b^2*c*d + 2*I*B^2*b^2*c*d)*x)*
log((b*x + a)^n) - 2*((I*a*b*c*d*n - I*a^2*d^2*n - I*b^2*c^2)*B^2 + (-I*A*B
*b^2*d^2 - I*B^2*b^2*d^2)*x^2 + (-I*A*B*b^2*c*d + (-I*a*b*d^2*n + b^2*c*d*(
I*n - 2*I))*B^2)*x + (-I*B^2*b^2*d^2*n*x^2 - 2*I*B^2*a*b*d^2*n*x - I*B^2*a^
2*d^2*n)*log(b*x + a) + (-I*B^2*b^2*d^2*x^2 - 2*I*B^2*b^2*c*d*x - I*B^2*b^2
*c^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^4*d*g^2*x^3 + a^2*b^2*c*g^2 +
(b^4*c*g^2 + 2*a*b^3*d*g^2)*x^2 + (2*a*b^3*c*g^2 + a^2*b^2*d*g^2)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, a
lgorithm="fricas")
```

```
[Out] integral(((I*A^2 + 2*I*A*B + I*B^2)*d*x + (I*B^2*d*n^2*x + I*B^2*c*n^2)*log
((b*x + a)/(d*x + c))^2 + (I*A^2 + 2*I*A*B + I*B^2)*c - 2*((-I*A*B - I*B^2)
*d*n*x + (-I*A*B - I*B^2)*c*n)*log((b*x + a)/(d*x + c)))/(b^2*g^2*x^2 + 2*a
*b*g^2*x + a^2*g^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(b*g*x + a
*g)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{{(a\,g+b\,g\,x)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x)^
2,x)
```

```
[Out] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x)^
2, x)
```

3.165 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=151

$$-\frac{B^2in^2(c+dx)^2}{4(bc-ad)g^3(a+bx)^2}-\frac{Bin(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2(bc-ad)g^3(a+bx)^2}-\frac{i(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2(bc-ad)g^3(a+bx)^2}$$

```
[Out] -1/4*B^2*i*n^2*(d*x+c)^2/(-a*d+b*c)/g^3/(b*x+a)^2-1/2*B*i*n*(d*x+c)^2*(A+B*
ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)/g^3/(b*x+a)^2-1/2*i*(d*x+c)^2*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)/g^3/(b*x+a)^2
```

Rubi [A]
time = 0.09, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.070$, Rules used = {2561, 2342, 2341}

$$-\frac{i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)}-\frac{Bin(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3(a+bx)^2(bc-ad)}-\frac{B^2in^2(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^
3,x]
```

```
[Out] -1/4*(B^2*i*n^2*(c + d*x)^2)/((b*c - a*d)*g^3*(a + b*x)^2) - (B*i*n*(c + d*
x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*g^3*(a + b*x)^2
) - (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)
*g^3*(a + b*x)^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(165c+165dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx = \int\left(\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^3(a+bx)^3} + \frac{165d(A+\ldots}{bg^3\ldots}\right.$$

$$= \frac{(165d)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2}dx}{bg^3} + \frac{(165(bc-ad))\int \frac{(A+B\ldots}{\ldots}}{bg^3}$$

$$= -\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2b^2g^3(a+bx)^2} - \frac{165d(A+B\,\mathrm{lo}\ldots}{b^2g^3(\ldots}$$

$$= -\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2b^2g^3(a+bx)^2} - \frac{165d(A+B\,\mathrm{lo}\ldots}{b^2g^3(\ldots}$$

$$= -\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2b^2g^3(a+bx)^2} - \frac{165d(A+B\,\mathrm{lo}\ldots}{b^2g^3(\ldots}$$

$$= -\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2b^2g^3(a+bx)^2} - \frac{165d(A+B\,\mathrm{lo}\ldots}{b^2g^3(\ldots}$$

$$= -\frac{165B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2g^3(a+bx)^2} - \frac{165Bdn(A\ldots}{b^2\ldots}$$

$$= -\frac{165B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2g^3(a+bx)^2} - \frac{165Bdn(A\ldots}{b^2\ldots}$$

$$= -\frac{165B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2g^3(a+bx)^2} - \frac{165Bdn(A\ldots}{b^2\ldots}$$

$$= -\frac{165B^2(bc-ad)n^2}{4b^2g^3(a+bx)^2} - \frac{165B^2dn^2}{2b^2g^3(a+bx)} - \frac{165B^2d^2n^2\log(a\ldots}{2b^2(bc-ad)\ldots}$$

$$= -\frac{165B^2(bc-ad)n^2}{4b^2g^3(a+bx)^2} - \frac{165B^2dn^2}{2b^2g^3(a+bx)} - \frac{165B^2d^2n^2\log(a\ldots}{2b^2(bc-ad)\ldots}$$

$$= -\frac{165B^2(bc-ad)n^2}{4b^2g^3(a+bx)^2} - \frac{165B^2dn^2}{2b^2g^3(a+bx)} - \frac{165B^2d^2n^2\log(a\ldots}{2b^2(bc-ad)\ldots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.60, size = 801, normalized size = 5.30

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x)^3,x]
```

```
[Out] -1/4*(i*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 4*d*(-(
b*c) + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 4*B*d*n*(a
 + b*x)*(2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d*(a + b*
x)*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*d*(a + b*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 2*B*n*(b*c - a*d + d*(a +
 b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*n*(a + b*x)*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) + B*d*n*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) +
a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])) + B*n*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d*(-(
b*c) + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*d^2*(a + b
*x)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d^2*(a + b*x)
^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*B*d*n*(a + b*x)*
(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*n*((b
*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x]
 + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*n*(a + b*x)^2*(Log[a + b*x]*(L
og[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x)
)/(-(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) +
a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
]))))/(b^2*(b*c - a*d)*g^3*(a + b*x)^2)
```

Maple [**F**]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{(bgx+ag)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2013 vs. $2(144) = 288$.
time = 0.41, size = 2013, normalized size = 13.33

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, a
lgorithm="maxima")
```

```
[Out] -1/2*I*A*B*d*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d
)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) +
2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3
) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)
*g^3)) + 1/2*I*A*B*c*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2
+ 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*
x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3
*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*I*(2*b*x + a)*B^2*d*log((b*x/(d
*x + c) + a/(d*x + c))^n*e)^2/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) +
 1/4*I*(2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*
c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^
3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*
b^2*c*d + a^2*b*d^2)*g^3))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - (b^2*c^
2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x
 + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c
*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*
(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a
^2*d^2)*log(b*x + a))*log(d*x + c))*n^2/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^
3 + a^4*b*d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 +
 2*(a*b^4*c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2*c - 1/4*I*
(2*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2
+ 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d
 - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b
*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3))*log
((b*x/(d*x + c) + a/(d*x + c))^n*e) + (7*a*b^2*c^2 - 8*a^2*b*c*d + a^3*d^2
- 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + 2*(2*a*b^2*c*d -
 a^2*b*d^2)*x)*log(b*x + a)^2 - 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b
^2*d^2)*x^2 + 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(d*x + c)^2 + 2*(4*b^3*c^2
- 5*a*b^2*c*d + a^2*b*d^2)*x + 2*(4*a^2*b*c*d - a^3*d^2 + (4*b^3*c*d - a*b^
2*d^2)*x^2 + 2*(4*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x + a) - 2*(4*a^2*b*c*d -
 a^3*d^2 + (4*b^3*c*d - a*b^2*d^2)*x^2 + 2*(4*a*b^2*c*d - a^2*b*d^2)*x - 2*
(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + 2*(2*a*b^2*c*d - a^2
*b*d^2)*x)*log(b*x + a))*log(d*x + c))*n^2/(a^2*b^4*c^2*g^3 - 2*a^3*b^3*c*d
*g^3 + a^4*b^2*d^2*g^3 + (b^6*c^2*g^3 - 2*a*b^5*c*d*g^3 + a^2*b^4*d^2*g^3)*
x^2 + 2*(a*b^5*c^2*g^3 - 2*a^2*b^4*c*d*g^3 + a^3*b^3*d^2*g^3)*x))*B^2*d - I
*(2*b*x + a)*A*B*d*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^4*g^3*x^2 + 2*
a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*I*B^2*c*log((b*x/(d*x + c) + a/(d*x + c))^
n*e)^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*I*(2*b*x + a)*A^2*d/
(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - I*A*B*c*log((b*x/(d*x + c) +
a/(d*x + c))^n*e)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*I*A^2*c/(
b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 478 vs. $2(144) = 288$.

time = 0.37, size = 478, normalized size = 3.17

$$\frac{2\,(-i\,A^2-2i\,AB-i\,B^2)b^2c^2+2\,(i\,A^2+2i\,AB+i\,B^2)a^2d^2-(i\,B^2b^2c^2-i\,B^2a^2d^2)n^2+2\,(-i\,B^2b^2d^2n^2x^2-2i\,B^2b^2cdn^2x-i\,B^2b^2c^2n^2)\log\left(\frac{bx+a}{dx+c}\right)^2+2\,((-i\,AB-i\,B^2)b^2c^2+(i\,AB+i\,B^2)a^2d^2)n+2\,(2\,(-i\,A^2-2i\,AB-i\,B^2)b^2cd+2\,(i\,A^2+2i\,AB+i\,B^2)abd^2+(-i\,B^2b^2cd+i\,B^2abd^2)n^2+2\,((-i\,AB-i\,B^2)b^2cd+(i\,AB+i\,B^2)abd^2)n)x+2\,(-i\,B^2b^2c^2n^2+2\,(-i\,AB-i\,B^2)b^2c^2n+(-i\,B^2b^2d^2n^2+2\,(-i\,AB-i\,B^2)b^2d^2n)x^2+2\,(-i\,B^2b^2cdn^2+2\,(-i\,AB-i\,B^2)b^2cdn)x)\log\left(\frac{bx+a}{dx+c}\right)}{4\,((b^5c-ab^4d)g^3x^2+2\,(ab^4c-a^2b^3d)g^3x+(a^2b^3c-a^3b^2d)g^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, a
lgorithm="fricas")
```

```
[Out] 1/4*(2*(-I*A^2 - 2*I*A*B - I*B^2)*b^2*c^2 + 2*(I*A^2 + 2*I*A*B + I*B^2)*a^2
*d^2 - (I*B^2*b^2*c^2 - I*B^2*a^2*d^2)*n^2 + 2*(-I*B^2*b^2*d^2*n^2*x^2 - 2*
I*B^2*b^2*c*d*n^2*x - I*B^2*b^2*c^2*n^2)*log((b*x + a)/(d*x + c))^2 + 2*((-
I*A*B - I*B^2)*b^2*c^2 + (I*A*B + I*B^2)*a^2*d^2)*n + 2*(2*(-I*A^2 - 2*I*A*
B - I*B^2)*b^2*c*d + 2*(I*A^2 + 2*I*A*B + I*B^2)*a*b*d^2 + (-I*B^2*b^2*c*d
+ I*B^2*a*b*d^2)*n^2 + 2*((-I*A*B - I*B^2)*b^2*c*d + (I*A*B + I*B^2)*a*b*d^
2)*n)*x + 2*(-I*B^2*b^2*c^2*n^2 + 2*(-I*A*B - I*B^2)*b^2*c^2*n + (-I*B^2*b^
2*d^2*n^2 + 2*(-I*A*B - I*B^2)*b^2*d^2*n)*x^2 + 2*(-I*B^2*b^2*c*d*n^2 + 2*(
-I*A*B - I*B^2)*b^2*c*d*n)*x)*log((b*x + a)/(d*x + c)))/((b^5*c - a*b^4*d)*
g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\left(\int\frac{A^2c}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int\frac{A^2dx}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int\frac{B^2c\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int\frac{2ABc\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int\frac{B^2dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int\frac{2ABdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx\right)}{g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3,x)
```

```
[Out] i*(Integral(A**2*c/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + In
tegral(A**2*d*x/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + Integ
ral(B**2*c*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a**3 + 3*a**2*b*x +
3*a*b**2*x**2 + b**3*x**3), x) + Integral(2*A*B*c*log(e*(a/(c + d*x) + b*x/
(c + d*x))**n)/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + Integr
al(B**2*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a**3 + 3*a**2*b*x +
 3*a*b**2*x**2 + b**3*x**3), x) + Integral(2*A*B*d*x*log(e*(a/(c + d*x) + b
*x/(c + d*x))**n)/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x))/g**3
```

Giac [A]
time = 6.45, size = 177, normalized size = 1.17

$$-\frac{1}{4}\left(\frac{2i\,(dx+c)^2B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^2}{(bx+a)^2g^3}+\frac{2\,(i\,B^2n^2+2i\,ABn+2i\,B^2n)(dx+c)^2\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)^2g^3}+\frac{(i\,B^2n^2+2i\,ABn+2i\,B^2n+2i\,A^2+4i\,AB+2i\,B^2)(dx+c)^2}{(bx+a)^2g^3}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, a
lgorithm="giac")
```

```
[Out] -1/4*(2*I*(d*x + c)^2*B^2*n^2*log((b*x + a)/(d*x + c))^2/((b*x + a)^2*g^3)
+ 2*(I*B^2*n^2 + 2*I*A*B*n + 2*I*B^2*n)*(d*x + c)^2*log((b*x + a)/(d*x + c)
)/((b*x + a)^2*g^3) + (I*B^2*n^2 + 2*I*A*B*n + 2*I*B^2*n + 2*I*A^2 + 4*I*A*
B + 2*I*B^2)*(d*x + c)^2/((b*x + a)^2*g^3))*(b*c/(b*c - a*d)^2 - a*d/(b*c -
 a*d)^2)
```

Mupad [B]
time = 6.82, size = 561, normalized size = 3.72

$$-\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^2\left(\frac{\frac{B^2\,c\,i}{2\,b}+\frac{B^2\,d\,i\,x}{b}+\frac{B^2\,a\,d\,i}{2\,b^2}}{a^2\,g^3+2\,a\,b\,g^3\,x+b^2\,g^3\,x^2}-\frac{B^2\,d^2\,i}{2\,b^2\,g^3\,\left(a\,d-b\,c\right)}\right)-\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\left(\frac{A\,B\,a\,d\,i+A\,B\,b\,c\,i-B^2\,a\,d\,i\,n+B^2\,b\,c\,i\,n+2\,A\,B\,b\,d\,i\,x}{a^2\,b^2\,g^3+2\,a\,b^3\,g^3\,x+b^4\,g^3\,x^2}+\frac{B^2\,d^2\,i\,\left(\frac{a\,b^2\,g^3\,n\,\left(a\,d-b\,c\right)}{2\,d}+\frac{b^3\,g^3\,n\,x\,\left(a\,d-b\,c\right)}{d}+\frac{b^2\,g^3\,n\,\left(a\,d-b\,c\right)\,\left(2\,a\,d-b\,c\right)}{2\,d^2}\right)}{b^2\,g^3\,\left(a\,d-b\,c\right)\,\left(a^2\,b^2\,g^3+2\,a\,b^3\,g^3\,x+b^4\,g^3\,x^2\right)}\right)-\frac{x\,\left(2\,b\,d\,i\,A^2+2\,b\,d\,i\,A\,B\,n+b\,d\,i\,B^2\,n^2\right)+A^2\,a\,d\,i+A^2\,b\,c\,i+\frac{B^2\,a\,d\,i\,n^2}{2}+\frac{B^2\,b\,c\,i\,n^2}{2}+A\,B\,a\,d\,i\,n+A\,B\,b\,c\,i\,n}{2\,a^2\,b^2\,g^3+4\,a\,b^3\,g^3\,x+2\,b^4\,g^3\,x^2}-\frac{B\,d^2\,i\,n\,\mathrm{atan}\left(\frac{B\,d^2\,i\,n\,\left(2\,A+B\,n\right)\,\left(\frac{c\,b^3\,g^3+a\,d\,b^2\,g^3}{b^2\,g^3}+2\,b\,d\,x\right)\,1{}\mathrm{i}}{\left(a\,d-b\,c\right)\,\left(i\,B^2\,d^2\,n^2+2\,A\,i\,B\,d^2\,n\right)}\right)\,\left(2\,A+B\,n\right)\,1{}\mathrm{i}}{b^2\,g^3\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x)^
3,x)
```

```
[Out] - log(e*((a + b*x)/(c + d*x))^n)^2*(((B^2*c*i)/(2*b) + (B^2*d*i*x)/b + (B^2
*a*d*i)/(2*b^2))/(a^2*g^3 + b^2*g^3*x^2 + 2*a*b*g^3*x) - (B^2*d^2*i)/(2*b^2
*g^3*(a*d - b*c))) - log(e*((a + b*x)/(c + d*x))^n)*((A*B*a*d*i + A*B*b*c*i
 - B^2*a*d*i*n + B^2*b*c*i*n + 2*A*B*b*d*i*x)/(a^2*b^2*g^3 + b^4*g^3*x^2 +
2*a*b^3*g^3*x) + (B^2*d^2*i*((a*b^2*g^3*n*(a*d - b*c))/(2*d) + (b^3*g^3*n*x
*(a*d - b*c))/d + (b^2*g^3*n*(a*d - b*c)*(2*a*d - b*c))/(2*d^2)))/(b^2*g^3*
(a*d - b*c)*(a^2*b^2*g^3 + b^4*g^3*x^2 + 2*a*b^3*g^3*x))) - (x*(2*A^2*b*d*i
 + B^2*b*d*i*n^2 + 2*A*B*b*d*i*n) + A^2*a*d*i + A^2*b*c*i + (B^2*a*d*i*n^2)
/2 + (B^2*b*c*i*n^2)/2 + A*B*a*d*i*n + A*B*b*c*i*n)/(2*a^2*b^2*g^3 + 2*b^4*
g^3*x^2 + 4*a*b^3*g^3*x) - (B*d^2*i*n*atan((B*d^2*i*n*(2*A + B*n)*((b^3*c*g
^3 + a*b^2*d*g^3)/(b^2*g^3) + 2*b*d*x)*1i)/((a*d - b*c)*(B^2*d^2*i*n^2 + 2*
A*B*d^2*i*n)))*(2*A + B*n)*1i)/(b^2*g^3*(a*d - b*c))
```

3.166 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=307

$$\frac{B^2din^2(c+dx)^2}{4(bc-ad)^2g^4(a+bx)^2}-\frac{2bB^2in^2(c+dx)^3}{27(bc-ad)^2g^4(a+bx)^3}+\frac{Bdin(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2(bc-ad)^2g^4(a+bx)^2}-\frac{2bBin(c+dx)^3}{9(bc-}$$

```
[Out] 1/4*B^2*d*i*n^2*(d*x+c)^2/(-a*d+b*c)^2/g^4/(b*x+a)^2-2/27*b*B^2*i*n^2*(d*x+
c)^3/(-a*d+b*c)^2/g^4/(b*x+a)^3+1/2*B*d*i*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d
*x+c))^n))/(-a*d+b*c)^2/g^4/(b*x+a)^2-2/9*b*B*i*n*(d*x+c)^3*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))/(-a*d+b*c)^2/g^4/(b*x+a)^3+1/2*d*i*(d*x+c)^2*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^2/g^4/(b*x+a)^2-1/3*b*i*(d*x+c)^3*(A+B*ln(e
*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^2/g^4/(b*x+a)^3
```

Rubi [A]
time = 0.18, antiderivative size = 307, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 2395, 2342, 2341}

$$-\frac{bi(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)^2}-\frac{2bBin(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^2}+\frac{di(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^4(a+bx)^2(bc-ad)^2}+\frac{Bdin(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^4(a+bx)^2(bc-ad)^2}-\frac{2bB^2in^2(c+dx)^3}{27g^4(a+bx)^3(bc-ad)^2}+\frac{B^2din^2(c+dx)^2}{4g^4(a+bx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^
4,x]
```

```
[Out] (B^2*d*i*n^2*(c + d*x)^2)/(4*(b*c - a*d)^2*g^4*(a + b*x)^2) - (2*b*B^2*i*n^
2*(c + d*x)^3)/(27*(b*c - a*d)^2*g^4*(a + b*x)^3) + (B*d*i*n*(c + d*x)^2*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^2*g^4*(a + b*x)^2) - (
2*b*B*i*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d
)^2*g^4*(a + b*x)^3) + (d*i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2)/(2*(b*c - a*d)^2*g^4*(a + b*x)^2) - (b*i*(c + d*x)^3*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^2*g^4*(a + b*x)^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(166c+166dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx = \int \left(\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^4(a+bx)^4} + \frac{166d\left(A+B\right.}{bg^4(\right.}\right.$$

$$= \frac{(166d)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^3}\,dx}{bg^4} + \frac{(166(bc-ad))\int \frac{\left(A+B\,\mathrm{lo}\right.}{}}{bg^4}$$

$$= -\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2g^4(a+bx)^3} - \frac{83d\left(A+B\log\right.}{b^2g^4(a+}$$

$$= -\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2g^4(a+bx)^3} - \frac{83d\left(A+B\log\right.}{b^2g^4(a+}$$

$$= -\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2g^4(a+bx)^3} - \frac{83d\left(A+B\log\right.}{b^2g^4(a+}$$

$$= -\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2g^4(a+bx)^3} - \frac{83d\left(A+B\log\right.}{b^2g^4(a+}$$

$$= -\frac{332B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^2g^4(a+bx)^3} - \frac{83Bdn\left(A+\right.}{3b^2g^4}$$

$$= -\frac{332B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^2g^4(a+bx)^3} - \frac{83Bdn\left(A+\right.}{3b^2g^4}$$

$$= -\frac{332B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^2g^4(a+bx)^3} - \frac{83Bdn\left(A+\right.}{3b^2g^4}$$

$$= -\frac{332B^2(bc-ad)n^2}{27b^2g^4(a+bx)^3} + \frac{83B^2dn^2}{18b^2g^4(a+bx)^2} + \frac{415B^2d^2n^2}{9b^2(bc-ad)g^4(a}$$

$$= -\frac{332B^2(bc-ad)n^2}{27b^2g^4(a+bx)^3} + \frac{83B^2dn^2}{18b^2g^4(a+bx)^2} + \frac{415B^2d^2n^2}{9b^2(bc-ad)g^4(a}$$

$$= -\frac{332B^2(bc-ad)n^2}{27b^2g^4(a+bx)^3} + \frac{83B^2dn^2}{18b^2g^4(a+bx)^2} + \frac{415B^2d^2n^2}{9b^2(bc-ad)g^4(a}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.73, size = 1079, normalized size = 3.51

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x)^4,x]
```

```
[Out] -1/108*(i*(36*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 54*d
*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 27*B*d*
n*(a + b*x)*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d*(
-(b*c) + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*d^2*(a +
 b*x)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d^2*(a + b*
x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*B*d*n*(a + b*x
)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*n*(
(b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*
x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*n*(a + b*x)^2*(Log[a + b*x]*
(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*
x))/(-(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*
d)])) + 2*B*n*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 18
*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^2*
(b*c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^3*(a
+ b*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 36*d^3*(a +
b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 36*B*d^2*n*(a
+ b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x])
- 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(
a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*n*(2*(b*c -
 a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d
^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*n*
(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
 - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*n*(a + b*x)^3*((2
*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)]))))/(b^2*(b*c - a*d)^2*g^4*(a + b*x)^3)
```

Maple [**F**]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{(bgx+ag)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3308 vs. 2(293) = 586.
time = 0.54, size = 3308, normalized size = 10.78

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, a
lgorithm="maxima")
```

```
[Out] -1/9*I*A*B*c*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^
2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a
*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^
3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4)
 + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d
^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
 a^3*b*d^3)*g^4)) - 1/18*I*A*B*d*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2
 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^
2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2
*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*
d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^
2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b
^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d
 + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/6*I*(3*b*x + a)*B^2*d*log((b*x/
(d*x + c) + a/(d*x + c))^n*e)^2/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*
g^4*x + a^3*b^2*g^4) - 1/54*I*(6*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d
+ 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4
*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^
2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c
*d + a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2
*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d
 + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log((b*x/(d*x + c) + a/(d*x + c))^n*e
) + (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*
d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x +
a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x
 + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3
)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x
+ a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 -
 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*
log(d*x + c))*n^2/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*
g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^
4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b
^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*
g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2*c - 1/108*I*(6*n*((5*a
*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*
b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*
d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2
*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*
d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*
b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log
```

```
(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4))*
log((b*x/(d*x + c) + a/(d*x + c))^n*e) + (19*a*b^3*c^3 - 189*a^2*b^2*c^2*d
+ 189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - 32*a*b^3*c*d^2 + 5*a^2*b
^2*d^3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3 +
 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*l
og(b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3
 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)
*log(d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + 135*a^2*b^2*c*d^2 - 19*a
^3*b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*a*b^3*d^3)*
x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*
b*d^3)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*
a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*b^2*c*d
^2 - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3
)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^
3)*x)*log(b*x + a))*log(d*x + c))*n^2/(a^3*b^5*c^3*g^4 - 3*a^4*b^4*c^2*d*g^
4 + 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^4 - 3*a*b^7*c^2*d*g^
4 + 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b^7*c^3*g^4 - 3*a^2*b
^6*c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x^2 + 3*(a^2*b^6*c^3*
g^4 - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b^3*d^3*g^4)*x))*B^2*
d - 1/3*I*(3*b*x + a)*A*B*d*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^5*g^4
*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*I*B^2*c*log((
b*x/(d*x + c) + a/(d*x + c))^n*e)^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*
b^2*g^4*x + a^3*b*g^4) - 1/6*I*(3*b*x + a)*A^2*d/(b^5*g^4*x^3 + 3*a*b^4*g^4
*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 2/3*I*A*B*c*log((b*x/(d*x + c) + a/
(d*x + c))^n*e)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^
4) - 1/3*I*A^2*c/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g
^4)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 948 vs. $2(293) = 586$.
time = 0.51, size = 948, normalized size = 3.09

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, a
lgorithm="fricas")
```

```
[Out] -1/108*(36*(I*A^2 + 2*I*A*B + I*B^2)*b^3*c^3 + 54*(-I*A^2 - 2*I*A*B - I*B^2
)*a*b^2*c^2*d + 18*(I*A^2 + 2*I*A*B + I*B^2)*a^3*d^3 - (-8*I*B^2*b^3*c^3 +
27*I*B^2*a*b^2*c^2*d - 19*I*B^2*a^3*d^3)*n^2 + 6*(5*(-I*B^2*b^3*c*d^2 + I*B
^2*a*b^2*d^3)*n^2 + 6*((-I*A*B - I*B^2)*b^3*c*d^2 + (I*A*B + I*B^2)*a*b^2*d
^3)*n)*x^2 + 18*(-I*B^2*b^3*d^3*n^2*x^3 - 3*I*B^2*a*b^2*d^3*n^2*x^2 + 3*(I*
B^2*b^3*c^2*d - 2*I*B^2*a*b^2*c*d^2)*n^2*x + (2*I*B^2*b^3*c^3 - 3*I*B^2*a*b
^2*c^2*d)*n^2)*log((b*x + a)/(d*x + c))^2 + 6*(4*(I*A*B + I*B^2)*b^3*c^3 +
```

```
9*(-I*A*B - I*B^2)*a*b^2*c^2*d + 5*(I*A*B + I*B^2)*a^3*d^3)*n + 3*(18*(I*A^
2 + 2*I*A*B + I*B^2)*b^3*c^2*d + 36*(-I*A^2 - 2*I*A*B - I*B^2)*a*b^2*c*d^2
+ 18*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b*d^3 + (-I*B^2*b^3*c^2*d - 18*I*B^2*a*b
^2*c*d^2 + 19*I*B^2*a^2*b*d^3)*n^2 + 6*((I*A*B + I*B^2)*b^3*c^2*d + 6*(-I*A
*B - I*B^2)*a*b^2*c*d^2 + 5*(I*A*B + I*B^2)*a^2*b*d^3)*n)*x + 6*((-5*I*B^2*
b^3*d^3*n^2 + 6*(-I*A*B - I*B^2)*b^3*d^3*n)*x^3 + (4*I*B^2*b^3*c^3 - 9*I*B^
2*a*b^2*c^2*d)*n^2 + 3*(6*(-I*A*B - I*B^2)*a*b^2*d^3*n + (-2*I*B^2*b^3*c*d^
2 - 3*I*B^2*a*b^2*d^3)*n^2)*x^2 + 6*(2*(I*A*B + I*B^2)*b^3*c^3 + 3*(-I*A*B
- I*B^2)*a*b^2*c^2*d)*n + 3*((I*B^2*b^3*c^2*d - 6*I*B^2*a*b^2*c*d^2)*n^2 +
6*((I*A*B + I*B^2)*b^3*c^2*d + 2*(-I*A*B - I*B^2)*a*b^2*c*d^2)*n)*x)*log((b
*x + a)/(d*x + c)))/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b
^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*
c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\left(\int \frac{A^2c}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{A^2dx}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{B^2c\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{2ABc\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{B^2dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{2ABdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx\right)}{g^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4,x)
```

```
[Out] i*(Integral(A**2*c/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 +
b**4*x**4), x) + Integral(A**2*d*x/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 +
4*a*b**3*x**3 + b**4*x**4), x) + Integral(B**2*c*log(e*(a/(c + d*x) + b*x/(
c + d*x))**n)**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b*
*4*x**4), x) + Integral(2*A*B*c*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a*
*4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integ
ral(B**2*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a**4 + 4*a**3*b*x
+ 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(2*A*B*d*x*lo
g(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2
 + 4*a*b**3*x**3 + b**4*x**4), x))/g**4
```

Giac [A]
time = 6.96, size = 491, normalized size = 1.60

$$-\frac{1}{108}\left(\frac{18\left(2i\,B^2bn^2-\frac{3(ibx+ia)B^2dn^2}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)^2}{\frac{(bx+a)^3bcg^4}{(dx+c)^3}-\frac{(bx+a)^3adg^4}{(dx+c)^3}}+\frac{6\left(4i\,B^2bn^2-\frac{9(ibx+ia)B^2dn^2}{dx+c}+12i\,ABbn+12i\,B^2bn-\frac{18(ibx+ia)ABdn}{dx+c}-\frac{18(ibx+ia)B^2dn}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^3bcg^4}{(dx+c)^3}-\frac{(bx+a)^3adg^4}{(dx+c)^3}}+\frac{8i\,B^2bn^2-\frac{27(ibx+ia)B^2dn^2}{dx+c}+24i\,ABbn+24i\,B^2bn-\frac{54(ibx+ia)ABdn}{dx+c}-\frac{54(ibx+ia)B^2dn}{dx+c}+36i\,A^2b+72i\,ABb+36i\,B^2b-\frac{54(ibx+ia)A^2d}{dx+c}-\frac{108(ibx+ia)ABd}{dx+c}-\frac{54(ibx+ia)B^2d}{dx+c}}{\frac{(bx+a)^3bcg^4}{(dx+c)^3}-\frac{(bx+a)^3adg^4}{(dx+c)^3}}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, a
lgorithm="giac")
```

```
[Out] -1/108*(18*(2*I*B^2*b*n^2 - 3*(I*b*x + I*a)*B^2*d*n^2/(d*x + c))*log((b*x +
 a)/(d*x + c))^2/((b*x + a)^3*b*c*g^4/(d*x + c)^3 - (b*x + a)^3*a*d*g^4/(d*
x + c)^3) + 6*(4*I*B^2*b*n^2 - 9*(I*b*x + I*a)*B^2*d*n^2/(d*x + c) + 12*I*A
```

```
*B*b*n + 12*I*B^2*b*n - 18*(I*b*x + I*a)*A*B*d*n/(d*x + c) - 18*(I*b*x + I*
a)*B^2*d*n/(d*x + c))*log((b*x + a)/(d*x + c))/((b*x + a)^3*b*c*g^4/(d*x +
c)^3 - (b*x + a)^3*a*d*g^4/(d*x + c)^3) + (8*I*B^2*b*n^2 - 27*(I*b*x + I*a)
*B^2*d*n^2/(d*x + c) + 24*I*A*B*b*n + 24*I*B^2*b*n - 54*(I*b*x + I*a)*A*B*d
*n/(d*x + c) - 54*(I*b*x + I*a)*B^2*d*n/(d*x + c) + 36*I*A^2*b + 72*I*A*B*b
 + 36*I*B^2*b - 54*(I*b*x + I*a)*A^2*d/(d*x + c) - 108*(I*b*x + I*a)*A*B*d/
(d*x + c) - 54*(I*b*x + I*a)*B^2*d/(d*x + c))/((b*x + a)^3*b*c*g^4/(d*x + c
)^3 - (b*x + a)^3*a*d*g^4/(d*x + c)^3))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d
)^2)
```

Mupad [B]
time = 7.86, size = 993, normalized size = 3.23

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x)^
4,x)
```

```
[Out] - ((18*A^2*a^2*d^2*i - 36*A^2*b^2*c^2*i + 19*B^2*a^2*d^2*i*n^2 - 8*B^2*b^2*
c^2*i*n^2 + 30*A*B*a^2*d^2*i*n - 24*A*B*b^2*c^2*i*n + 18*A^2*a*b*c*d*i + 19
*B^2*a*b*c*d*i*n^2 + 30*A*B*a*b*c*d*i*n)/(6*(a*d - b*c)) + (x*(18*A^2*a*b*d
^2*i - 18*A^2*b^2*c*d*i + 19*B^2*a*b*d^2*i*n^2 + B^2*b^2*c*d*i*n^2 + 30*A*B
*a*b*d^2*i*n - 6*A*B*b^2*c*d*i*n))/(2*(a*d - b*c)) + (x^2*(5*B^2*b^2*d^2*i*
n^2 + 6*A*B*b^2*d^2*i*n))/(a*d - b*c))/(18*a^3*b^2*g^4 + 18*b^5*g^4*x^3 + 5
4*a^2*b^3*g^4*x + 54*a*b^4*g^4*x^2) - log(e*((a + b*x)/(c + d*x))^n)^2*(((B
^2*c*i)/(3*b) + (B^2*d*i*x)/(2*b) + (B^2*a*d*i)/(6*b^2))/(a^3*g^4 + b^3*g^4
*x^3 + 3*a*b^2*g^4*x^2 + 3*a^2*b*g^4*x) - (B^2*d^3*i)/(6*b^2*g^4*(a^2*d^2 +
 b^2*c^2 - 2*a*b*c*d))) - log(e*((a + b*x)/(c + d*x))^n)*((A*B*a*d*i + 2*A*
B*b*c*i - B^2*a*d*i*n + B^2*b*c*i*n + 3*A*B*b*d*i*x)/(3*a^3*b^2*g^4 + 3*b^5
*g^4*x^3 + 9*a^2*b^3*g^4*x + 9*a*b^4*g^4*x^2) + (B^2*d^3*i*(x*(b*((a*b^2*g^
4*n*(a*d - b*c))/d + (b^2*g^4*n*(a*d - b*c)*(3*a*d - b*c))/(2*d^2)) + (2*a*
b^3*g^4*n*(a*d - b*c))/d + (b^3*g^4*n*(a*d - b*c)*(3*a*d - b*c))/d^2) + a*(
(a*b^2*g^4*n*(a*d - b*c))/d + (b^2*g^4*n*(a*d - b*c)*(3*a*d - b*c))/(2*d^2)
) + (3*b^4*g^4*n*x^2*(a*d - b*c))/d + (b^2*g^4*n*(a*d - b*c)*(3*a^2*d^2 + b
^2*c^2 - 3*a*b*c*d))/d^3))/(3*b^2*g^4*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(3*a^
3*b^2*g^4 + 3*b^5*g^4*x^3 + 9*a^2*b^3*g^4*x + 9*a*b^4*g^4*x^2))) - (B*d^3*i
*n*atan((B*d^3*i*n*(6*A + 5*B*n)*(2*b*d*x - (b^4*c^2*g^4 - a^2*b^2*d^2*g^4)
/(b^2*g^4*(a*d - b*c)))*1i)/((a*d - b*c)*(5*B^2*d^3*i*n^2 + 6*A*B*d^3*i*n))
)*(6*A + 5*B*n)*1i)/(9*b^2*g^4*(a*d - b*c)^2)
```

3.167 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=475

$$-\frac{B^2d^2in^2(c+dx)^2}{4(bc-ad)^3g^5(a+bx)^2}+\frac{4bB^2din^2(c+dx)^3}{27(bc-ad)^3g^5(a+bx)^3}-\frac{b^2B^2in^2(c+dx)^4}{32(bc-ad)^3g^5(a+bx)^4}-\frac{Bd^2in(c+dx)^2\left(A+B\log\left(\right.\right.}{2(bc-ad)^3g^5(a+bx}$$

```
[Out] -1/4*B^2*d^2*i*n^2*(d*x+c)^2/(-a*d+b*c)^3/g^5/(b*x+a)^2+4/27*b*B^2*d*i*n^2*
(d*x+c)^3/(-a*d+b*c)^3/g^5/(b*x+a)^3-1/32*b^2*B^2*i*n^2*(d*x+c)^4/(-a*d+b*c
)^3/g^5/(b*x+a)^4-1/2*B*d^2*i*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(
-a*d+b*c)^3/g^5/(b*x+a)^2+4/9*b*B*d*i*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c
))^n))/(-a*d+b*c)^3/g^5/(b*x+a)^3-1/8*b^2*B*i*n*(d*x+c)^4*(A+B*ln(e*((b*x+a
)/(d*x+c))^n))/(-a*d+b*c)^3/g^5/(b*x+a)^4-1/2*d^2*i*(d*x+c)^2*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^5/(b*x+a)^2+2/3*b*d*i*(d*x+c)^3*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^5/(b*x+a)^3-1/4*b^2*i*(d*x+c)^4*(
A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^5/(b*x+a)^4
```

Rubi [A]
time = 0.26, antiderivative size = 475, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {2561, 2395, 2342, 2341}

$$-\frac{b^2i(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^3}-\frac{b^2Bin(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^3}-\frac{d^2i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^5(a+bx)^2(bc-ad)^3}-\frac{Bd^2in(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^5(a+bx)^2(bc-ad)^3}+\frac{2bdi(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^5(a+bx)^3(bc-ad)^3}+\frac{4bBdin(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^5(a+bx)^3(bc-ad)^3}-\frac{b^2B^2in^2(c+dx)^4}{32g^5(a+bx)^4(bc-ad)^3}-\frac{B^2d^2in^2(c+dx)^2}{4g^5(a+bx)^2(bc-ad)^3}+\frac{4bB^2din^2(c+dx)^3}{27g^5(a+bx)^3(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^
5,x]
```

```
[Out] -1/4*(B^2*d^2*i*n^2*(c + d*x)^2)/((b*c - a*d)^3*g^5*(a + b*x)^2) + (4*b*B^2
*d*i*n^2*(c + d*x)^3)/(27*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*B^2*i*n^2*(
c + d*x)^4)/(32*(b*c - a*d)^3*g^5*(a + b*x)^4) - (B*d^2*i*n*(c + d*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (4
*b*B*d*i*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*
d)^3*g^5*(a + b*x)^3) - (b^2*B*i*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n]))/(8*(b*c - a*d)^3*g^5*(a + b*x)^4) - (d^2*i*(c + d*x)^2*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*
d*i*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^3*
g^5*(a + b*x)^3) - (b^2*i*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(4*(b*c - a*d)^3*g^5*(a + b*x)^4)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
```

```
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(167c+167dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}dx = \int \left(\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^5(a+bx)^5}+\frac{167d\left(A+B\right.}{bg^5(\ldots}\right.$$

$$= \frac{(167d)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^4}dx}{bg^5}+\frac{(167(bc-ad))\int \frac{\left(A+B\,\mathrm{lo}\right.}{}}{bg^5}$$

$$= -\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2g^5(a+bx)^4}-\frac{167d\left(A+B\log\right.}{3b^2g^5(a\ldots}$$

$$= -\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2g^5(a+bx)^4}-\frac{167d\left(A+B\log\right.}{3b^2g^5(a\ldots}$$

$$= -\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2g^5(a+bx)^4}-\frac{167d\left(A+B\log\right.}{3b^2g^5(a\ldots}$$

$$= -\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2g^5(a+bx)^4}-\frac{167d\left(A+B\log\right.}{3b^2g^5(a\ldots}$$

$$= -\frac{167B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8b^2g^5(a+bx)^4}-\frac{167Bdn\left(A+\right.}{18b^2g\ldots}$$

$$= -\frac{167B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8b^2g^5(a+bx)^4}-\frac{167Bdn\left(A+\right.}{18b^2g\ldots}$$

$$= -\frac{167B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8b^2g^5(a+bx)^4}-\frac{167Bdn\left(A+\right.}{18b^2g\ldots}$$

$$= -\frac{167B^2(bc-ad)n^2}{32b^2g^5(a+bx)^4}+\frac{835B^2dn^2}{216b^2g^5(a+bx)^3}+\frac{167B^2d\ldots}{144b^2(bc-ad)\ldots}$$

$$= -\frac{167B^2(bc-ad)n^2}{32b^2g^5(a+bx)^4}+\frac{835B^2dn^2}{216b^2g^5(a+bx)^3}+\frac{167B^2d\ldots}{144b^2(bc-ad)\ldots}$$

$$= -\frac{167B^2(bc-ad)n^2}{32b^2g^5(a+bx)^4}+\frac{835B^2dn^2}{216b^2g^5(a+bx)^3}+\frac{167B^2d\ldots}{144b^2(bc-ad)\ldots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.89, size = 1392, normalized size = 2.93

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x)^5,x]
```

```
[Out] -1/864*(i*(216*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 288
*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 16
*B*d*n*(a + b*x)*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) -
 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d
^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^3*
(a + b*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 36*d^3*(a
 + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 36*B*d^2*n*
(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x
]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^
2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*n*(2*(b*
c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 +
6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3
*n*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d
)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*n*(a + b*x)^3*
((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])) + 3*B*n*(36*(b*c - a*d)^4*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]) + 144*d^4*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])*Log[c + d*x] - 144*B*d^3*n*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*Lo
g[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*n*(a + b*x)^2*((b*c - a*d
)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2
*(a + b*x)^2*Log[c + d*x]) - 8*B*d*n*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c
- a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[
a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*n*(3*(b*c - a*d)^4 + 4*d*(
-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c
) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*x)^4
*Log[c + d*x]) + 72*B*d^4*n*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log
[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
- 72*B*d^4*n*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*
x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(b^2*(b*c -
a*d)^3*g^5*(a + b*x)^4)
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{(bgx+ag)^{5}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 4834 vs. $2(454) = 908$.
time = 0.73, size = 4834, normalized size = 10.18

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, a
lgorithm="maxima")
```

```
[Out] 1/24*I*A*B*c*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d
^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*
c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*
b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b
^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*
b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6
*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*
d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d
^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*
a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/72
*I*A*B*d*n*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 +
 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2
*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b
*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4
 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3
+ 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2
 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x
+ (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12
*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2
*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x
 + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4
*b^2*d^4)*g^5)) - 1/12*I*(4*b*x + a)*B^2*d*log((b*x/(d*x + c) + a/(d*x + c)
)^n*e)^2/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5
*x + a^4*b^2*g^5) + 1/288*I*(12*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c
^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b
^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a
^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^
3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a
^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*
a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6
*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*
d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x
```

```
+ c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*
b*d^4)*g^5))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - (9*b^4*c^4 - 64*a*b^3
*c^3*d + 216*a^2*b^2*c^2*d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d
^3 - a*b^3*d^4)*x^3 + 6*(13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4
)*x^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4
*x + a^4*d^4)*log(b*x + a)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^
2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a
*b^3*c^2*d^2 + 324*a^2*b^2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*
a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) +
 12*(25*b^4*d^4*x^4 + 100*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d
^4*x + 25*a^4*d^4 - 12*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 +
 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a))*log(d*x + c))*n^2/(a^4*b^5*c^4*g^5
- 4*a^5*b^4*c^3*d*g^5 + 6*a^6*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b
*d^4*g^5 + (b^9*c^4*g^5 - 4*a*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3
*b^6*c*d^3*g^5 + a^4*b^5*d^4*g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*
g^5 + 6*a^3*b^6*c^2*d^2*g^5 - 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 +
6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^
4*c*d^3*g^5 + a^6*b^3*d^4*g^5)*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g
^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2
*c - 1/864*I*(12*n*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a
^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2
 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 -
13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)
*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*
g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)
*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3
)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g
^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2
*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)
*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d
^3 + a^4*b^2*d^4)*g^5))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + (37*a*b^4*
c^4 - 304*a^2*b^3*c^3*d + 1512*a^3*b^2*c^2*d^2 - 1360*a^4*b*c*d^3 + 115*a^5
*d^4 + 12*(88*b^5*c^2*d^2 - 101*a*b^4*c*d^3 + 13*a^2*b^3*d^4)*x^3 - 6*(40*b
^5*c^3*d - 609*a*b^4*c^2*d^2 + 648*a^2*b^3*c*d^3 - 79*a^3*b^2*d^4)*x^2 - 72
*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^...
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1529 vs. $2(454) = 908$.
time = 0.56, size = 1529, normalized size = 3.22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, a
lgorithm="fricas")
```

```
[Out] 1/864*(216*(-I*A^2 - 2*I*A*B - I*B^2)*b^4*c^4 + 576*(I*A^2 + 2*I*A*B + I*B^
2)*a*b^3*c^3*d + 432*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b^2*c^2*d^2 + 72*(I*A^2
 + 2*I*A*B + I*B^2)*a^4*d^4 + 12*(13*(-I*B^2*b^4*c*d^3 + I*B^2*a*b^3*d^4)*n
^2 + 12*((-I*A*B - I*B^2)*b^4*c*d^3 + (I*A*B + I*B^2)*a*b^3*d^4)*n)*x^3 - (
27*I*B^2*b^4*c^4 - 128*I*B^2*a*b^3*c^3*d + 216*I*B^2*a^2*b^2*c^2*d^2 - 115*
I*B^2*a^4*d^4)*n^2 + 6*((I*B^2*b^4*c^2*d^2 - 80*I*B^2*a*b^3*c*d^3 + 79*I*B^
2*a^2*b^2*d^4)*n^2 + 12*((I*A*B + I*B^2)*b^4*c^2*d^2 + 8*(-I*A*B - I*B^2)*a
*b^3*c*d^3 + 7*(I*A*B + I*B^2)*a^2*b^2*d^4)*n)*x^2 + 72*(-I*B^2*b^4*d^4*n^2
*x^4 - 4*I*B^2*a*b^3*d^4*n^2*x^3 - 6*I*B^2*a^2*b^2*d^4*n^2*x^2 + 4*(-I*B^2*
b^4*c^3*d + 3*I*B^2*a*b^3*c^2*d^2 - 3*I*B^2*a^2*b^2*c*d^3)*n^2*x + (-3*I*B^
2*b^4*c^4 + 8*I*B^2*a*b^3*c^3*d - 6*I*B^2*a^2*b^2*c^2*d^2)*n^2)*log((b*x +
a)/(d*x + c))^2 + 12*(9*(-I*A*B - I*B^2)*b^4*c^4 + 32*(I*A*B + I*B^2)*a*b^3
*c^3*d + 36*(-I*A*B - I*B^2)*a^2*b^2*c^2*d^2 + 13*(I*A*B + I*B^2)*a^4*d^4)*
n + 4*(72*(-I*A^2 - 2*I*A*B - I*B^2)*b^4*c^3*d + 216*(I*A^2 + 2*I*A*B + I*B
^2)*a*b^3*c^2*d^2 + 216*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b^2*c*d^3 + 72*(I*A^
2 + 2*I*A*B + I*B^2)*a^3*b*d^4 + (5*I*B^2*b^4*c^3*d - 12*I*B^2*a*b^3*c^2*d^
2 - 108*I*B^2*a^2*b^2*c*d^3 + 115*I*B^2*a^3*b*d^4)*n^2 + 12*((-I*A*B - I*B^
2)*b^4*c^3*d + 6*(I*A*B + I*B^2)*a*b^3*c^2*d^2 + 18*(-I*A*B - I*B^2)*a^2*b^
2*c*d^3 + 13*(I*A*B + I*B^2)*a^3*b*d^4)*n)*x + 12*((-13*I*B^2*b^4*d^4*n^2 +
 12*(-I*A*B - I*B^2)*b^4*d^4*n)*x^4 + 4*(12*(-I*A*B - I*B^2)*a*b^3*d^4*n +
(-3*I*B^2*b^4*c*d^3 - 10*I*B^2*a*b^3*d^4)*n^2)*x^3 + (-9*I*B^2*b^4*c^4 + 32
*I*B^2*a*b^3*c^3*d - 36*I*B^2*a^2*b^2*c^2*d^2)*n^2 + 6*(12*(-I*A*B - I*B^2)
*a^2*b^2*d^4*n + (I*B^2*b^4*c^2*d^2 - 8*I*B^2*a*b^3*c*d^3 - 6*I*B^2*a^2*b^2
*d^4)*n^2)*x^2 + 12*(3*(-I*A*B - I*B^2)*b^4*c^4 + 8*(I*A*B + I*B^2)*a*b^3*c
^3*d + 6*(-I*A*B - I*B^2)*a^2*b^2*c^2*d^2)*n + 4*((-I*B^2*b^4*c^3*d + 6*I*B
^2*a*b^3*c^2*d^2 - 18*I*B^2*a^2*b^2*c*d^3)*n^2 + 12*((-I*A*B - I*B^2)*b^4*c
^3*d + 3*(I*A*B + I*B^2)*a*b^3*c^2*d^2 + 3*(-I*A*B - I*B^2)*a^2*b^2*c*d^3)*
n)*x)*log((b*x + a)/(d*x + c)))/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2
 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2
- a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2
 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^
2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 -
 a^7*b^2*d^3)*g^5)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [**A**]

time = 7.55, size = 841, normalized size = 1.77

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, a
lgorithm="giac")
```

```
[Out] 1/864*(72*(-3*I*B^2*b^2*n^2 - 8*(-I*b*x - I*a)*B^2*b*d*n^2/(d*x + c) - 6*I*
(b*x + a)^2*B^2*d^2*n^2/(d*x + c)^2)*log((b*x + a)/(d*x + c))^2/((b*x + a)^
4*b^2*c^2*g^5/(d*x + c)^4 - 2*(b*x + a)^4*a*b*c*d*g^5/(d*x + c)^4 + (b*x +
a)^4*a^2*d^2*g^5/(d*x + c)^4) + 12*(-9*I*B^2*b^2*n^2 - 32*(-I*b*x - I*a)*B^
2*b*d*n^2/(d*x + c) - 36*I*(b*x + a)^2*B^2*d^2*n^2/(d*x + c)^2 - 36*I*A*B*b
^2*n - 36*I*B^2*b^2*n - 96*(-I*b*x - I*a)*A*B*b*d*n/(d*x + c) - 96*(-I*b*x
- I*a)*B^2*b*d*n/(d*x + c) - 72*I*(b*x + a)^2*A*B*d^2*n/(d*x + c)^2 - 72*I*
(b*x + a)^2*B^2*d^2*n/(d*x + c)^2)*log((b*x + a)/(d*x + c))/((b*x + a)^4*b^
2*c^2*g^5/(d*x + c)^4 - 2*(b*x + a)^4*a*b*c*d*g^5/(d*x + c)^4 + (b*x + a)^4
*a^2*d^2*g^5/(d*x + c)^4) + (-27*I*B^2*b^2*n^2 - 128*(-I*b*x - I*a)*B^2*b*d
*n^2/(d*x + c) - 216*I*(b*x + a)^2*B^2*d^2*n^2/(d*x + c)^2 - 108*I*A*B*b^2*
n - 108*I*B^2*b^2*n - 384*(-I*b*x - I*a)*A*B*b*d*n/(d*x + c) - 384*(-I*b*x
- I*a)*B^2*b*d*n/(d*x + c) - 432*I*(b*x + a)^2*A*B*d^2*n/(d*x + c)^2 - 432*
I*(b*x + a)^2*B^2*d^2*n/(d*x + c)^2 - 216*I*A^2*b^2 - 432*I*A*B*b^2 - 216*I
*B^2*b^2 - 576*(-I*b*x - I*a)*A^2*b*d/(d*x + c) - 1152*(-I*b*x - I*a)*A*B*b
*d/(d*x + c) - 576*(-I*b*x - I*a)*B^2*b*d/(d*x + c) - 432*I*(b*x + a)^2*A^2
*d^2/(d*x + c)^2 - 864*I*(b*x + a)^2*A*B*d^2/(d*x + c)^2 - 432*I*(b*x + a)^
2*B^2*d^2/(d*x + c)^2)/((b*x + a)^4*b^2*c^2*g^5/(d*x + c)^4 - 2*(b*x + a)^4
*a*b*c*d*g^5/(d*x + c)^4 + (b*x + a)^4*a^2*d^2*g^5/(d*x + c)^4))*(b*c/(b*c
- a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 9.74, size = 1794, normalized size = 3.78

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x)^
5,x)
```

```
[Out] ((72*A^2*a^3*d^3*i + 216*A^2*b^3*c^3*i + 115*B^2*a^3*d^3*i*n^2 + 27*B^2*b^3
*c^3*i*n^2 + 156*A*B*a^3*d^3*i*n + 108*A*B*b^3*c^3*i*n - 360*A^2*a*b^2*c^2*
d*i + 72*A^2*a^2*b*c*d^2*i - 101*B^2*a*b^2*c^2*d*i*n^2 + 115*B^2*a^2*b*c*d^
2*i*n^2 - 276*A*B*a*b^2*c^2*d*i*n + 156*A*B*a^2*b*c*d^2*i*n)/(12*(a*d - b*c
)) + (x^2*(79*B^2*a*b^2*d^3*i*n^2 - B^2*b^3*c*d^2*i*n^2 + 84*A*B*a*b^2*d^3*
i*n - 12*A*B*b^3*c*d^2*i*n))/(2*(a*d - b*c)) + (x*(72*A^2*a^2*b*d^3*i + 72*
A^2*b^3*c^2*d*i + 115*B^2*a^2*b*d^3*i*n^2 - 5*B^2*b^3*c^2*d*i*n^2 - 144*A^2
```

```
*a*b^2*c*d^2*i + 7*B^2*a*b^2*c*d^2*i*n^2 + 156*A*B*a^2*b*d^3*i*n + 12*A*B*b
^3*c^2*d*i*n - 60*A*B*a*b^2*c*d^2*i*n))/(3*(a*d - b*c)) + (d*x^3*(13*B^2*b^
3*d^2*i*n^2 + 12*A*B*b^3*d^2*i*n))/(a*d - b*c))/(x*(288*a^3*b^4*c*g^5 - 288
*a^4*b^3*d*g^5) - x^3*(288*a^2*b^5*d*g^5 - 288*a*b^6*c*g^5) + x^4*(72*b^7*c
*g^5 - 72*a*b^6*d*g^5) + x^2*(432*a^2*b^5*c*g^5 - 432*a^3*b^4*d*g^5) + 72*a
^4*b^3*c*g^5 - 72*a^5*b^2*d*g^5) - log(e*((a + b*x)/(c + d*x))^n)^2*(((B^2*
c*i)/(4*b) + (B^2*d*i*x)/(3*b) + (B^2*a*d*i)/(12*b^2))/(a^4*g^5 + b^4*g^5*x
^4 + 4*a*b^3*g^5*x^3 + 6*a^2*b^2*g^5*x^2 + 4*a^3*b*g^5*x) - (B^2*d^4*i)/(12
*b^2*g^5*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) - log(e*((a
+ b*x)/(c + d*x))^n)*((A*B*a*d*i + 3*A*B*b*c*i - B^2*a*d*i*n + B^2*b*c*i*n
+ 4*A*B*b*d*i*x)/(6*a^4*b^2*g^5 + 6*b^6*g^5*x^4 + 24*a^3*b^3*g^5*x + 24*a*b
^5*g^5*x^3 + 36*a^2*b^4*g^5*x^2) + (B^2*d^4*i*(x^2*(b*(b*((3*a*b^2*g^5*n*(a
*d - b*c))/(2*d) + (b^2*g^5*n*(a*d - b*c)*(4*a*d - b*c))/(2*d^2)) + (3*a*b^
3*g^5*n*(a*d - b*c))/d + (b^3*g^5*n*(a*d - b*c)*(4*a*d - b*c))/d^2) + (9*a*
b^4*g^5*n*(a*d - b*c))/(2*d) + (3*b^4*g^5*n*(a*d - b*c)*(4*a*d - b*c))/(2*d
^2)) + a*(a*((3*a*b^2*g^5*n*(a*d - b*c))/(2*d) + (b^2*g^5*n*(a*d - b*c)*(4*
a*d - b*c))/(2*d^2)) + (b^2*g^5*n*(a*d - b*c)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*
c*d))/(2*d^3)) + x*(a*(b*((3*a*b^2*g^5*n*(a*d - b*c))/(2*d) + (b^2*g^5*n*(a
*d - b*c)*(4*a*d - b*c))/(2*d^2)) + (3*a*b^3*g^5*n*(a*d - b*c))/d + (b^3*g^
5*n*(a*d - b*c)*(4*a*d - b*c))/d^2) + b*(a*((3*a*b^2*g^5*n*(a*d - b*c))/(2*
d) + (b^2*g^5*n*(a*d - b*c)*(4*a*d - b*c))/(2*d^2)) + (b^2*g^5*n*(a*d - b*c
)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(2*d^3)) + (3*b^3*g^5*n*(a*d - b*c)*(6
*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(2*d^3)) + (3*b^2*g^5*n*(a*d - b*c)*(4*a^3
*d^3 - b^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d^2))/(2*d^4) + (6*b^5*g^5*n*x^3
*(a*d - b*c))/d))/(6*b^2*g^5*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c
*d^2)*(6*a^4*b^2*g^5 + 6*b^6*g^5*x^4 + 24*a^3*b^3*g^5*x + 24*a*b^5*g^5*x^3
+ 36*a^2*b^4*g^5*x^2))) - (B*d^4*i*n*atan((B*d^4*i*n*(12*A + 13*B*n)*((b^5*
c^3*g^5 + a^3*b^2*d^3*g^5 - a*b^4*c^2*d*g^5 - a^2*b^3*c*d^2*g^5)/(b^4*c^2*g
^5 + a^2*b^2*d^2*g^5 - 2*a*b^3*c*d*g^5) + 2*b*d*x)*(b^4*c^2*g^5 + a^2*b^2*d
^2*g^5 - 2*a*b^3*c*d*g^5)*1i)/(b^2*g^5*(a*d - b*c)^3*(13*B^2*d^4*i*n^2 + 12
*A*B*d^4*i*n)))*(12*A + 13*B*n)*1i)/(36*b^2*g^5*(a*d - b*c)^3)
```

3.168 $\int (ag+bgx)^3(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=766

$$\frac{3B^2(bc-ad)^5g^3i^2n^2x}{20b^2d^3}+\frac{B^2(bc-ad)^2g^3i^2n^2(a+bx)^4}{60b^3}-\frac{3B^2(bc-ad)^4g^3i^2n^2(c+dx)^2}{40bd^4}+\frac{B^2(bc-ad)^3g^3i^2n^2(}{60d^4}$$

```
[Out] 3/20*B^2*(-a*d+b*c)^5*g^3*i^2*n^2*x/b^2/d^3+1/60*B^2*(-a*d+b*c)^2*g^3*i^2*n
^2*(b*x+a)^4/b^3-3/40*B^2*(-a*d+b*c)^4*g^3*i^2*n^2*(d*x+c)^2/b/d^4+1/60*B^2
*(-a*d+b*c)^3*g^3*i^2*n^2*(d*x+c)^3/d^4-1/90*B*(-a*d+b*c)^3*g^3*i^2*n*(b*x+
a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/d-1/20*B*(-a*d+b*c)^2*g^3*i^2*n*(b
*x+a)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3-1/15*B*(-a*d+b*c)*g^3*i^2*n*(b*
x+a)^4*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2+1/60*(-a*d+b*c)^2*g^3*i^
2*(b*x+a)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^3+1/15*(-a*d+b*c)*g^3*i^2*(
b*x+a)^4*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^2+1/6*g^3*i^2*(b*x+a)^
4*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b+1/180*B*(-a*d+b*c)^4*g^3*i^
2*n*(b*x+a)^2*(3*A+B*n+3*B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/d^2-1/180*B*(-a*d
+b*c)^5*g^3*i^2*n*(b*x+a)*(6*A+5*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/d^3
-1/180*B*(-a*d+b*c)^6*g^3*i^2*n*(6*A+11*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))*
ln((-a*d+b*c)/b/(d*x+c))/b^3/d^4-1/20*B^2*(-a*d+b*c)^6*g^3*i^2*n^2*ln(d*x+c
)/b^3/d^4-1/30*B^2*(-a*d+b*c)^6*g^3*i^2*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/
b^3/d^4
```

Rubi [A]

time = 0.71, antiderivative size = 766, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 13, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.289$, Rules used = {2561, 2383, 2381, 2384, 2354, 2438, 2373, 45, 47, 37, 2382, 12, 79}

$$-\frac{B^2g^3i^2n^2(bc-ad)^6\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{30b^3d^4}-\frac{Bg^3i^2n(bc-ad)^6\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+11Bn\right)}{180b^3d^4}-\frac{Bg^3i^2n(a+bx)(bc-ad)^5\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+5Bn\right)}{180b^3d^3}+\frac{Bg^3i^2n(a+bx)^2(bc-ad)^4\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{180b^3d^2}-\frac{Bg^3i^2n(a+bx)^3(bc-ad)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{90b^3d}+\frac{g^3i^2(a+bx)^4(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{60b^3}-\frac{Bg^3i^2n(a+bx)^4(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{20b^3}+\frac{g^3i^2(a+bx)^4(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{15b^2}-\frac{Bg^3i^2n(a+bx)^4(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{15b^2}+\frac{g^3i^2(a+bx)^4(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{6b}-\frac{B^2g^3i^2n^2(bc-ad)^6\log(c+dx)}{20b^3d^4}+\frac{B^2g^3i^2n^2(a+bx)^4(bc-ad)^2}{60b^3}+\frac{3B^2g^3i^2n^2x(bc-ad)^5}{20b^2d^3}-\frac{3B^2g^3i^2n^2(c+dx)^2(bc-ad)^4}{40bd^4}+\frac{B^2g^3i^2n^2(c+dx)^3(bc-ad)^3}{60d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2,x]
```

```
[Out] (3*B^2*(b*c - a*d)^5*g^3*i^2*n^2*x)/(20*b^2*d^3) + (B^2*(b*c - a*d)^2*g^3*i
^2*n^2*(a + b*x)^4)/(60*b^3) - (3*B^2*(b*c - a*d)^4*g^3*i^2*n^2*(c + d*x)^2
)/(40*b*d^4) + (B^2*(b*c - a*d)^3*g^3*i^2*n^2*(c + d*x)^3)/(60*d^4) - (B*(b
*c - a*d)^3*g^3*i^2*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(
90*b^3*d) - (B*(b*c - a*d)^2*g^3*i^2*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(20*b^3) - (B*(b*c - a*d)*g^3*i^2*n*(a + b*x)^4*(c + d*x)*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*b^2) + ((b*c - a*d)^2*g^3*i^2*(a
 + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(60*b^3) + ((b*c - a*d)
*g^3*i^2*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(1
5*b^2) + (g^3*i^2*(a + b*x)^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
```

```
)^n])^2)/(6*b) + (B*(b*c - a*d)^4*g^3*i^2*n*(a + b*x)^2*(3*A + B*n + 3*B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/(180*b^3*d^2) - (B*(b*c - a*d)^5*g^3*i^2*n*(
a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n]))/(180*b^3*d^3)
- (B*(b*c - a*d)^6*g^3*i^2*n*(6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(180*b^3*d^4) - (B^2*(b*c - a*d)^6*g^
3*i^2*n^2*Log[c + d*x])/(20*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*n^2*PolyL
og[2, (d*(a + b*x))/(b*(c + d*x))])/(30*b^3*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*(S
implify[m + n + 2]/((b*c - a*d)*(m + 1))), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
```

```
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (168c+168dx)^2(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx = \int\left(\frac{28224(bc-ad)^2(ag+bgx)^3\left(A+\right.}{b^2}\right.$$

$$= \frac{\left(28224(bc-ad)^2\right)\int(ag+bgx)^3\left(A+\right.}{b^2}$$

$$= \frac{7056(bc-ad)^2g^3(a+bx)^4\left(A+B\log\right.}{b^3}$$

$$= \frac{7056(bc-ad)^2g^3(a+bx)^4\left(A+B\log\right.}{b^3}$$

$$= \frac{7056(bc-ad)^2g^3(a+bx)^4\left(A+B\log\right.}{b^3}$$

$$= \frac{7056(bc-ad)^2g^3(a+bx)^4\left(A+B\log\right.}{b^3}$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3}+\frac{2352B(bc}{}$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3}-\frac{4704B^2(b}{}$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3}-\frac{4704B^2(b}{}$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3}+\frac{3136B^2(b}{5}$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3}+\frac{3136B^2(b}{5}$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3}+\frac{3136B^2(b}{5}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1634 vs. $2(766) = 1532$.
time = 0.96, size = 1634, normalized size = 2.13

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2,x]
```

```
[Out] (g^3*i^2*(15*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2 + 24*d*(b*c - a*d)*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2 + 10*d^2*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (5*B*(b*c
 - a*d)^3*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*
((a + b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*
x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n*(
b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a +
b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])))/d^4 + (2*B*(b*c - a*d)^2*n*(24*A*b*d*(b*c - a*d)^3*x +
 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 12*d^2*(b*
c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*d^3*(b*c
- a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*d^4*(a + b*x)
^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*
x] - 24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] +
 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)
^2*Log[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) +
 a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 12*
B*(b*c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c - a*d)^
4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4 - (B*(b*c - a*d)*n*(120*A*b*d*
(b*c - a*d)^4*x + 120*B*d*(b*c - a*d)^4*(a + b*x)*Log[e*((a + b*x)/(c + d*x
))^n] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) + 24*d^5*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 120*B*
(b*c - a*d)^5*n*Log[c + d*x] - 120*(b*c - a*d)^5*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])*Log[c + d*x] + 20*B*(b*c - a*d)^3*n*(2*b*d*(b*c - a*d)*x - d^2
*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 5*B*(b*c - a*d)^2*n*(6*b*d*(
b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(
b*c - a*d)^3*Log[c + d*x]) + 2*B*(b*c - a*d)*n*(12*b*d*(b*c - a*d)^3*x - 6*
d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b*x)^3 - 3*d^4*(a +
b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) + 60*B*(b*c - a*d)^4*n*(b*d*x + (-(
b*c) + a*d)*Log[c + d*x]) + 60*B*(b*c - a*d)^5*n*((2*Log[(d*(a + b*x))/(-(b
*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])))/(6*d^4)))/(60*b^3)
```

Maple [F]

time = 0.32, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^{3} \left(dix+ci\right)^{2} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 4882 vs. $2(699) = 1398$.
time = 0.85, size = 4882, normalized size = 6.37

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="maxima")
```

```
[Out] -1/3*A*B*b^3*d^2*g^3*x^6*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/6*A^2*b
^3*d^2*g^3*x^6 - 4/5*A*B*b^3*c*d*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^
n*e) - 6/5*A*B*a*b^2*d^2*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2
/5*A^2*b^3*c*d*g^3*x^5 - 3/5*A^2*a*b^2*d^2*g^3*x^5 - 1/2*A*B*b^3*c^2*g^3*x^
4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3*A*B*a*b^2*c*d*g^3*x^4*log((b*x
/(d*x + c) + a/(d*x + c))^n*e) - 3/2*A*B*a^2*b*d^2*g^3*x^4*log((b*x/(d*x +
c) + a/(d*x + c))^n*e) - 1/4*A^2*b^3*c^2*g^3*x^4 - 3/2*A^2*a*b^2*c*d*g^3*x^
4 - 3/4*A^2*a^2*b*d^2*g^3*x^4 - 2*A*B*a*b^2*c^2*g^3*x^3*log((b*x/(d*x + c)
+ a/(d*x + c))^n*e) - 4*A*B*a^2*b*c*d*g^3*x^3*log((b*x/(d*x + c) + a/(d*x +
 c))^n*e) - 2/3*A*B*a^3*d^2*g^3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)
- A^2*a*b^2*c^2*g^3*x^3 - 2*A^2*a^2*b*c*d*g^3*x^3 - 1/3*A^2*a^3*d^2*g^3*x^3
 - 3*A*B*a^2*b*c^2*g^3*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2*A*B*a
^3*c*d*g^3*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/2*A^2*a^2*b*c^2*g
^3*x^2 - A^2*a^3*c*d*g^3*x^2 + 1/180*A*B*b^3*d^2*g^3*n*(60*a^6*log(b*x + a)
/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*
c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c
^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) - 1/15*A*B*b^3
*c*d*g^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d
^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^
3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/10*A*B*a*b^2*d^2*g^
3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*
b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4
)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) + 1/12*A*B*b^3*c^2*g^3*n*(6*a^
4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^
3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1
/2*A*B*a*b^2*c*d*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (
2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3
- a^3*d^3)*x)/(b^3*d^3)) + 1/4*A*B*a^2*b*d^2*g^3*n*(6*a^4*log(b*x + a)/b^4
- 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d -
a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - A*B*a*b^2*c^2*g^3*n*
```

```
(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2
 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*a^2*b*c*d*g^3*n*(2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2)) - 1/3*A*B*a^3*d^2*g^3*n*(2*a^3*log(b*x + a)/b^3
- 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)
*x)/(b^2*d^2)) + 3*A*B*a^2*b*c^2*g^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x
+ c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^3*c*d*g^3*n*(a^2*log(b*x + a)/b^2
 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 2*A*B*a^3*c^2*g^3*n*(a*log
(b*x + a)/b - c*log(d*x + c)/d) - 2*A*B*a^3*c^2*g^3*x*log((b*x/(d*x + c) +
a/(d*x + c))^n*e) - A^2*a^3*c^2*g^3*x + 1/180*(33*a^4*b*c^2*d^4*g^3*n^2 - 6
*a^5*c*d^5*g^3*n^2 - 2*(n^2 + 3*n)*b^5*c^6*g^3 + 6*(n^2 + 6*n)*a*b^4*c^5*d*
g^3 + 3*(n^2 - 30*n)*a^2*b^3*c^4*d^2*g^3 - 2*(17*n^2 - 60*n)*a^3*b^2*c^3*d^
3*g^3)*B^2*log(d*x + c)/(b^2*d^4) - 1/30*(b^6*c^6*g^3*n^2 - 6*a*b^5*c^5*d*g
^3*n^2 + 15*a^2*b^4*c^4*d^2*g^3*n^2 - 20*a^3*b^3*c^3*d^3*g^3*n^2 + 15*a^4*b
^2*c^2*d^4*g^3*n^2 - 6*a^5*b*c*d^5*g^3*n^2 + a^6*d^6*g^3*n^2)*(log(b*x + a)
*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^
2/(b^3*d^4) - 1/360*(60*B^2*b^6*d^6*g^3*x^6 + 24*(a*b^5*d^6*g^3*(n + 9) - b
^6*c*d^5*g^3*(n - 6))*B^2*x^5 + 6*((n^2 - 7*n + 15)*b^6*c^2*d^4*g^3 - 2*(n^
2 + 3*n - 45)*a*b^5*c*d^5*g^3 + (n^2 + 13*n + 45)*a^2*b^4*d^6*g^3)*B^2*x^4
+ 2*((3*n^2 - 2*n)*b^6*c^3*d^3*g^3 + 3*(n^2 - 26*n + 60)*a*b^5*c^2*d^4*g^3
- 3*(5*n^2 - 14*n - 120)*a^2*b^4*c*d^5*g^3 + (9*n^2 + 38*n + 60)*a^3*b^3*d^
6*g^3)*B^2*x^3 - ((7*n^2 - 6*n)*b^6*c^4*d^2*g^3 - 2*(23*n^2 - 18*n)*a*b^5*c
^3*d^3*g^3 + 60*(n^2 + 3*n - 9)*a^2*b^4*c^2*d^4*g^3 - 2*(5*n^2 + 102*n + 18
0)*a^3*b^3*c*d^5*g^3 - (11*n^2 + 6*n)*a^4*b^2*d^6*g^3)*B^2*x^2 - 6*(15*a^4*
b^2*c^2*d^4*g^3*n^2 - 6*a^5*b*c*d^5*g^3*n^2 + a^6*d^6*g^3*n^2)*B^2*log(b*x
+ a)^2 - 12*(b^6*c^6*g^3*n^2 - 6*a*b^5*c^5*d*g^3*n^2 + 15*a^2*b^4*c^4*d^2*g
^3*n^2 - 20*a^3*b^3*c^3*d^3*g^3*n^2)*B^2*log(b*x + a)*log(d*x + c) + 6*(b^6
*c^6*g^3*n^2 - 6*a*b^5*c^5*d*g^3*n^2 + 15*a^2*b^4*c^4*d^2*g^3*n^2 - 20*a^3*
b^3*c^3*d^3*g^3*n^2)*B^2*log(d*x + c)^2 + 2*(2*(2*n^2 - 3*n)*b^6*c^5*d*g^3
- 9*(3*n^2 - 4*n)*a*b^5*c^4*d^2*g^3 + (77*n^2 - 90*n)*a^2*b^4*c^3*d^3*g^3 -
 (97*n^2 - 30*n - 180)*a^3*b^3*c^2*d^4*g^3 + 3*(17*n^2 + 12*n)*a^4*b^2*c*d^
5*g^3 - 2*(4*n^2 + 3*n)*a^5*b*d^6*g^3)*B^2*x - 2*(6*a*b^5*c^5*d*g^3*n^2 - 3
3*a^2*b^4*c^4*d^2*g^3*n^2 + 74*a^3*b^3*c^3*d^3*g^3*n^2 - 9*(7*n^2 + 10*n)*a
^4*b^2*c^2*d^4*g^3 + 18*(n^2 + 2*n)*a^5*b*c*d^5*g^3 - 2*(n^2 + 3*n)*a^6*d^6
*g^3)*B^2*log(b*x + a) + 6*(10*B^2*b^6*d^6*g^3*x^6 + 60*B^2*a^3*b^3*c^2*d^4
*g^3*x + 12*(2*b^6*c*d^5*g^3 + 3*a*b^5*d^6*g^3)*B^2*x^5 + 15*(b^6*c^2*d^4*g
^3 + 6*a*b^5*c*d^5*g^3 + 3*a^2*b^4*d^6*g^3)*B^2...
```

<u>Fricas</u> [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="fricas")
```

```
[Out] -1/60*(10*B^2*b^3*d^2*g^3*n^2*x^6 + 60*B^2*a^3*c^2*g^3*n^2*x + 12*(2*B^2*b^
3*c*d + 3*B^2*a*b^2*d^2)*g^3*n^2*x^5 + 15*(B^2*b^3*c^2 + 6*B^2*a*b^2*c*d +
3*B^2*a^2*b*d^2)*g^3*n^2*x^4 + 20*(3*B^2*a*b^2*c^2 + 6*B^2*a^2*b*c*d + B^2*
a^3*d^2)*g^3*n^2*x^3 + 30*(3*B^2*a^2*b*c^2 + 2*B^2*a^3*c*d)*g^3*n^2*x^2)*lo
g((b*x + a)/(d*x + c))^2 + integral(-1/30*(30*(A^2 + 2*A*B + B^2)*b^4*d^3*g
^3*x^7 + 30*(A^2 + 2*A*B + B^2)*a^4*c^3*g^3 + 30*(3*(A^2 + 2*A*B + B^2)*b^4
*c*d^2 + 4*(A^2 + 2*A*B + B^2)*a*b^3*d^3)*g^3*x^6 + 90*((A^2 + 2*A*B + B^2)
*b^4*c^2*d + 4*(A^2 + 2*A*B + B^2)*a*b^3*c*d^2 + 2*(A^2 + 2*A*B + B^2)*a^2*
b^2*d^3)*g^3*x^5 + 30*((A^2 + 2*A*B + B^2)*b^4*c^3 + 12*(A^2 + 2*A*B + B^2)
*a*b^3*c^2*d + 18*(A^2 + 2*A*B + B^2)*a^2*b^2*c*d^2 + 4*(A^2 + 2*A*B + B^2)
*a^3*b*d^3)*g^3*x^4 + 30*(4*(A^2 + 2*A*B + B^2)*a*b^3*c^3 + 18*(A^2 + 2*A*B
 + B^2)*a^2*b^2*c^2*d + 12*(A^2 + 2*A*B + B^2)*a^3*b*c*d^2 + (A^2 + 2*A*B +
 B^2)*a^4*d^3)*g^3*x^3 + 90*(2*(A^2 + 2*A*B + B^2)*a^2*b^2*c^3 + 4*(A^2 + 2
*A*B + B^2)*a^3*b*c^2*d + (A^2 + 2*A*B + B^2)*a^4*c*d^2)*g^3*x^2 + 30*(4*(A
^2 + 2*A*B + B^2)*a^3*b*c^3 + 3*(A^2 + 2*A*B + B^2)*a^4*c^2*d)*g^3*x + (60*
(A*B + B^2)*b^4*d^3*g^3*n*x^7 + 60*(A*B + B^2)*a^4*c^3*g^3*n - 10*((B^2*b^4
*c*d^2 - B^2*a*b^3*d^3)*g^3*n^2 - 6*(3*(A*B + B^2)*b^4*c*d^2 + 4*(A*B + B^2
)*a*b^3*d^3)*g^3*n)*x^6 - 12*((2*B^2*b^4*c^2*d + B^2*a*b^3*c*d^2 - 3*B^2*a^
2*b^2*d^3)*g^3*n^2 - 15*((A*B + B^2)*b^4*c^2*d + 4*(A*B + B^2)*a*b^3*c*d^2
+ 2*(A*B + B^2)*a^2*b^2*d^3)*g^3*n)*x^5 - 15*((B^2*b^4*c^3 + 5*B^2*a*b^3*c^
2*d - 3*B^2*a^2*b^2*c*d^2 - 3*B^2*a^3*b*d^3)*g^3*n^2 - 4*((A*B + B^2)*b^4*c
^3 + 12*(A*B + B^2)*a*b^3*c^2*d + 18*(A*B + B^2)*a^2*b^2*c*d^2 + 4*(A*B + B
^2)*a^3*b*d^3)*g^3*n)*x^4 - 20*((3*B^2*a*b^3*c^3 + 3*B^2*a^2*b^2*c^2*d - 5*
B^2*a^3*b*c*d^2 - B^2*a^4*d^3)*g^3*n^2 - 3*(4*(A*B + B^2)*a*b^3*c^3 + 18*(A
*B + B^2)*a^2*b^2*c^2*d + 12*(A*B + B^2)*a^3*b*c*d^2 + (A*B + B^2)*a^4*d^3)
*g^3*n)*x^3 - 30*((3*B^2*a^2*b^2*c^3 - B^2*a^3*b*c^2*d - 2*B^2*a^4*c*d^2)*g
^3*n^2 - 6*(2*(A*B + B^2)*a^2*b^2*c^3 + 4*(A*B + B^2)*a^3*b*c^2*d + (A*B +
B^2)*a^4*c*d^2)*g^3*n)*x^2 - 60*((B^2*a^3*b*c^3 - B^2*a^4*c^2*d)*g^3*n^2 -
(4*(A*B + B^2)*a^3*b*c^3 + 3*(A*B + B^2)*a^4*c^2*d)*g^3*n)*x)*log((b*x + a)
/(d*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2
,x)
```

```
[Out] Timed out
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)^3\,(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^
2,x)
```

```
[Out] int((a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^
2, x)
```

3.169 $\int (ag+bgx)^2(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=819

$$-\frac{B^2(bc-ad)^4g^2i^2n^2x}{10b^2d^2}-\frac{B^2(bc-ad)^3g^2i^2n^2(c+dx)^2}{20bd^3}+\frac{B^2(bc-ad)^2g^2i^2n^2(c+dx)^3}{30d^3}-\frac{B(bc-ad)^3g^2i^2n(a$$

```
[Out] -1/10*B^2*(-a*d+b*c)^4*g^2*i^2*n^2*x/b^2/d^2-1/20*B^2*(-a*d+b*c)^3*g^2*i^2*
n^2*(d*x+c)^2/b/d^3+1/30*B^2*(-a*d+b*c)^2*g^2*i^2*n^2*(d*x+c)^3/d^3-1/30*B*
(-a*d+b*c)^3*g^2*i^2*n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/d-1/15
*B*(-a*d+b*c)^2*g^2*i^2*n*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3-1/5
*B*(-a*d+b*c)^3*g^2*i^2*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/d^3+4
/15*B*(-a*d+b*c)^2*g^2*i^2*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^3-
1/10*b*B*(-a*d+b*c)*g^2*i^2*n*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^3
+1/30*(-a*d+b*c)^2*g^2*i^2*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^3+
1/10*(-a*d+b*c)*g^2*i^2*(b*x+a)^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2
/b^2+1/5*g^2*i^2*(b*x+a)^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b+1/
30*B*(-a*d+b*c)^4*g^2*i^2*n*(b*x+a)*(2*A+B*n+2*B*ln(e*((b*x+a)/(d*x+c))^n))
/b^3/d^2+1/30*B*(-a*d+b*c)^5*g^2*i^2*n*(2*A+3*B*n+2*B*ln(e*((b*x+a)/(d*x+c)
)^n))*ln((-a*d+b*c)/b/(d*x+c))/b^3/d^3+1/30*B^2*(-a*d+b*c)^5*g^2*i^2*n^2*ln
((b*x+a)/(d*x+c))/b^3/d^3+1/10*B^2*(-a*d+b*c)^5*g^2*i^2*n^2*ln(d*x+c)/b^3/d
^3+1/15*B^2*(-a*d+b*c)^5*g^2*i^2*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^3/d^3
```

Rubi [A]
time = 0.67, antiderivative size = 819, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 11, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.244$, Rules used = {2561, 2383, 2381, 2384, 2354, 2438, 2373, 45, 2382, 12, 907}

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2,x]
```

```
[Out] -1/10*(B^2*(b*c - a*d)^4*g^2*i^2*n^2*x)/(b^2*d^2) - (B^2*(b*c - a*d)^3*g^2*
i^2*n^2*(c + d*x)^2)/(20*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^2*n^2*(c + d*x)^
3)/(30*d^3) - (B*(b*c - a*d)^3*g^2*i^2*n*(a + b*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(30*b^3*d) - (B*(b*c - a*d)^2*g^2*i^2*n*(a + b*x)^3*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*b^3) - (B*(b*c - a*d)^3*g^2*i^2*n*(c
 + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b*d^3) + (4*B*(b*c - a
*d)^2*g^2*i^2*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*d^3
) - (b*B*(b*c - a*d)*g^2*i^2*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/(10*d^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])^2)/(30*b^3) + ((b*c - a*d)*g^2*i^2*(a + b*x)^3*(c + d*x)*
```

```
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(10*b^2) + (g^2*i^2*(a + b*x)^3*(
c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b) + (B*(b*c - a*d)
^4*g^2*i^2*n*(a + b*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n]))/(3
0*b^3*d^2) + (B*(b*c - a*d)^5*g^2*i^2*n*(2*A + 3*B*n + 2*B*Log[e*((a + b*x)
/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(30*b^3*d^3) + (B^2*(b*c -
a*d)^5*g^2*i^2*n^2*Log[(a + b*x)/(c + d*x)])/(30*b^3*d^3) + (B^2*(b*c - a*d
)^5*g^2*i^2*n^2*Log[c + d*x])/(10*b^3*d^3) + (B^2*(b*c - a*d)^5*g^2*i^2*n^2
*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(15*b^3*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (169c+169dx)^2(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx = \int \left(\frac{(-bc+ad)^2g^2(169c+169dx)^2\,(A\cdots}{d^2}\right.$$

$$= \frac{(b^2g^2)\int(169c+169dx)^4\,(A+B\log(e(\cdots}{28561d^2}$$

$$= \frac{28561(bc-ad)^2g^2(c+dx)^3\,(A+B\log\cdots}{3d^3}$$

$$= \frac{28561(bc-ad)^2g^2(c+dx)^3\,(A+B\log\cdots}{3d^3}$$

$$= \frac{28561(bc-ad)^2g^2(c+dx)^3\,(A+B\log\cdots}{3d^3}$$

$$= \frac{28561(bc-ad)^2g^2(c+dx)^3\,(A+B\log\cdots}{3d^3}$$

$$= -\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2} - \frac{28561B(b\cdots}{\cdots}$$

$$= -\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2} - \frac{28561B^2(\cdots}{\cdots}$$

$$= -\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2} - \frac{28561B^2(\cdots}{\cdots}$$

$$= -\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2} - \frac{28561B^2(\cdots}{1\cdots}$$

$$= -\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2} - \frac{28561B^2(\cdots}{1\cdots}$$

$$= -\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2} - \frac{28561B^2(\cdots}{1\cdots}$$

Mathematica [A]
time = 0.66, size = 1254, normalized size = 1.53

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2,x]
```

```
[Out] (g^2*i^2*(20*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2 + 30*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2 + 12*d^5*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 20*
B*(b*c - a*d)^3*n*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[
e*((a + b*x)/(c + d*x))^n] - d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(b*d*x + (-(b*c) +
 a*d)*Log[c + d*x]) + B*(b*c - a*d)^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
 - 10*B*(b*c - a*d)^2*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a +
 b*x)*Log[e*((a + b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*
(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c
- a*d)^2*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*
Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)])) + B*(b*c - a*d)*n*(24*A*b*d*(b*c - a*d)^3*x
 + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 12*d^2*(
b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*d^3*(b*
c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*d^4*(a + b*
x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c +
d*x] - 24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x]
 + 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*
d)^2*Log[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c)
 + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 1
2*B*(b*c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c - a*d
)^4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(60*b^3*d^3)
```

Maple [F]
time = 0.26, size = 0, normalized size = 0.00

$$\int (bgx + ag)^2 (dix + ci)^2 \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 3499 vs. 2(748) = 1496.
time = 0.81, size = 3499, normalized size = 4.27

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="maxima")
```

```
[Out] -2/5*A*B*b^2*d^2*g^2*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/5*A^2*b
^2*d^2*g^2*x^5 - A*B*b^2*c*d*g^2*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e)
 - A*B*a*b*d^2*g^2*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/2*A^2*b^2
*c*d*g^2*x^4 - 1/2*A^2*a*b*d^2*g^2*x^4 - 2/3*A*B*b^2*c^2*g^2*x^3*log((b*x/(
d*x + c) + a/(d*x + c))^n*e) - 8/3*A*B*a*b*c*d*g^2*x^3*log((b*x/(d*x + c) +
 a/(d*x + c))^n*e) - 2/3*A*B*a^2*d^2*g^2*x^3*log((b*x/(d*x + c) + a/(d*x +
c))^n*e) - 1/3*A^2*b^2*c^2*g^2*x^3 - 4/3*A^2*a*b*c*d*g^2*x^3 - 1/3*A^2*a^2*
d^2*g^2*x^3 - 2*A*B*a*b*c^2*g^2*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e)
- 2*A*B*a^2*c*d*g^2*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - A^2*a*b*c^
2*g^2*x^2 - A^2*a^2*c*d*g^2*x^2 - 1/30*A*B*b^2*d^2*g^2*n*(12*a^5*log(b*x +
a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*
c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 -
a^4*d^4)*x)/(b^4*d^4)) + 1/6*A*B*b^2*c*d*g^2*n*(6*a^4*log(b*x + a)/b^4 - 6*
c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*
b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/6*A*B*a*b*d^2*g^2*n*(6
*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)
*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))
- 1/3*A*B*b^2*c^2*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 -
((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 4/3*A*B*a*
b*c*d*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d -
a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 1/3*A*B*a^2*d^2*g^2*n*
(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2
 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 2*A*B*a*b*c^2*g^2*n*(a^2*log(b*x +
 a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^2*c*d*g^2*n
*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 2*A*
B*a^2*c^2*g^2*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) - 2*A*B*a^2*c^2*g^2*x
*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - A^2*a^2*c^2*g^2*x + 1/30*(9*a^3*b
*c^2*d^3*g^2*n^2 - 2*a^4*c*d^4*g^2*n^2 + 2*(n^2 - 5*n)*a*b^3*c^4*d*g^2 - (9
*n^2 - 20*n)*a^2*b^2*c^3*d^2*g^2 + 2*b^4*c^5*g^2*n)*B^2*log(d*x + c)/(b^2*d
^3) + 1/15*(b^5*c^5*g^2*n^2 - 5*a*b^4*c^4*d*g^2*n^2 + 10*a^2*b^3*c^3*d^2*g^
2*n^2 - 10*a^3*b^2*c^2*d^3*g^2*n^2 + 5*a^4*b*c*d^4*g^2*n^2 - a^5*d^5*g^2*n^
2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/
(b*c - a*d)))*B^2/(b^3*d^3) - 1/60*(12*B^2*b^5*d^5*g^2*x^5 + 6*(a*b^4*d^5*g
^2*(n + 5) - b^5*c*d^4*g^2*(n - 5))*B^2*x^4 + 2*((n^2 - 6*n + 10)*b^5*c^2*d
^3*g^2 - 2*(n^2 - 20)*a*b^4*c*d^4*g^2 + (n^2 + 6*n + 10)*a^2*b^3*d^5*g^2)*B
^2*x^3 + ((3*n^2 - 2*n)*b^5*c^3*d^2*g^2 - 3*(n^2 + 10*n - 20)*a*b^4*c^2*d^3
*g^2 - 3*(n^2 - 10*n - 20)*a^2*b^3*c*d^4*g^2 + (3*n^2 + 2*n)*a^3*b^2*d^5*g^
2)*B^2*x^2 - 2*(10*a^3*b^2*c^2*d^3*g^2*n^2 - 5*a^4*b*c*d^4*g^2*n^2 + a^5*d^
5*g^2*n^2)*B^2*log(b*x + a)^2 + 4*(b^5*c^5*g^2*n^2 - 5*a*b^4*c^4*d*g^2*n^2
+ 10*a^2*b^3*c^3*d^2*g^2*n^2)*B^2*log(b*x + a)*log(d*x + c) - 2*(b^5*c^5*g^
```

```
2*n^2 - 5*a*b^4*c^4*d*g^2*n^2 + 10*a^2*b^3*c^3*d^2*g^2*n^2)*B^2*log(d*x + c
)^2 - 2*(2*(n^2 - n)*b^5*c^4*d*g^2 - (11*n^2 - 10*n)*a*b^4*c^3*d^2*g^2 + 6*
(3*n^2 - 5)*a^2*b^3*c^2*d^3*g^2 - (11*n^2 + 10*n)*a^3*b^2*c*d^4*g^2 + 2*(n^
2 + n)*a^4*b*d^5*g^2)*B^2*x + 2*(2*a*b^4*c^4*d*g^2*n^2 - 9*a^2*b^3*c^3*d^2*
g^2*n^2 + (9*n^2 + 20*n)*a^3*b^2*c^2*d^3*g^2 - 2*(n^2 + 5*n)*a^4*b*c*d^4*g^
2 + 2*a^5*d^5*g^2*n)*B^2*log(b*x + a) + 2*(6*B^2*b^5*d^5*g^2*x^5 + 30*B^2*a
^2*b^3*c^2*d^3*g^2*x + 15*(b^5*c*d^4*g^2 + a*b^4*d^5*g^2)*B^2*x^4 + 10*(b^5
*c^2*d^3*g^2 + 4*a*b^4*c*d^4*g^2 + a^2*b^3*d^5*g^2)*B^2*x^3 + 30*(a*b^4*c^2
*d^3*g^2 + a^2*b^3*c*d^4*g^2)*B^2*x^2)*log((b*x + a)^n)^2 + 2*(6*B^2*b^5*d^
5*g^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*x + 15*(b^5*c*d^4*g^2 + a*b^4*d^5*g^
2)*B^2*x^4 + 10*(b^5*c^2*d^3*g^2 + 4*a*b^4*c*d^4*g^2 + a^2*b^3*d^5*g^2)*B^2
*x^3 + 30*(a*b^4*c^2*d^3*g^2 + a^2*b^3*c*d^4*g^2)*B^2*x^2)*log((d*x + c)^n)
^2 + 2*(12*B^2*b^5*d^5*g^2*x^5 + 3*(a*b^4*d^5*g^2*(n + 10) - b^5*c*d^4*g^2*
(n - 10))*B^2*x^4 + 2*(a^2*b^3*d^5*g^2*(3*n + 10) - b^5*c^2*d^3*g^2*(3*n -
10) + 40*a*b^4*c*d^4*g^2)*B^2*x^3 + (15*a^2*b^3*c*d^4*g^2*(n + 4) - 15*a*b^
4*c^2*d^3*g^2*(n - 4) - b^5*c^3*d^2*g^2*n + a^3*b^2*d^5*g^2*n)*B^2*x^2 + 2*
(b^5*c^4*d*g^2*n - 5*a*b^4*c^3*d^2*g^2*n + 5*a^3*b^2*c*d^4*g^2*n - a^4*b*d^
5*g^2*n + 30*a^2*b^3*c^2*d^3*g^2)*B^2*x + 2*(10*a^3*b^2*c^2*d^3*g^2*n - 5*a
^4*b*c*d^4*g^2*n + a^5*d^5*g^2*n)*B^2*log(b*x + a) - 2*(b^5*c^5*g^2*n - 5*a
*b^4*c^4*d*g^2*n + 10*a^2*b^3*c^3*d^2*g^2*n)*B^2*log(d*x + c))*log((b*x + a
)^n) - 2*(12*B^2*b^5*d^5*g^2*x^5 + 3*(a*b^4*d^5*g^2*(n + 10) - b^5*c*d^4*g^
2*(n - 10))*B^2*x^4 + 2*(a^2*b^3*d^5*g^2*(3*n + 10) - b^5*c^2*d^3*g^2*(3*n
- 10) + 40*a*b^4*c*d^4*g^2)*B^2*x^3 + (15*a^2*b^3*c*d^4*g^2*(n + 4) - 15*a*
b^4*c^2*d^3*g^2*(n - 4) - b^5*c^3*d^2*g^2*n + a^3*b^2*d^5*g^2*n)*B^2*x^2 +
2*(b^5*c^4*d*g^2*n - 5*a*b^4*c^3*d^2*g^2*n + 5*a^3*b^2*c*d^4*g^2*n - a^4*b*
d^5*g^2*n + 30*a^2*b^3*c^2*d^3*g^2)*B^2*x + 2*(10*a^3*b^2*c^2*d^3*g^2*n - 5
*a^4*b*c*d^4*g^2*n + a^5*d^5*g^2*n)*B^2*log(b*x...
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="fricas")
```

```
[Out] -1/30*(6*B^2*b^2*d^2*g^2*n^2*x^5 + 30*B^2*a^2*c^2*g^2*n^2*x + 15*(B^2*b^2*c
*d + B^2*a*b*d^2)*g^2*n^2*x^4 + 10*(B^2*b^2*c^2 + 4*B^2*a*b*c*d + B^2*a^2*d
^2)*g^2*n^2*x^3 + 30*(B^2*a*b*c^2 + B^2*a^2*c*d)*g^2*n^2*x^2)*log((b*x + a)
/(d*x + c))^2 + integral(-1/15*(15*(A^2 + 2*A*B + B^2)*b^3*d^3*g^2*x^6 + 15
*(A^2 + 2*A*B + B^2)*a^3*c^3*g^2 + 45*((A^2 + 2*A*B + B^2)*b^3*c*d^2 + (A^2
 + 2*A*B + B^2)*a*b^2*d^3)*g^2*x^5 + 45*((A^2 + 2*A*B + B^2)*b^3*c^2*d + 3*
(A^2 + 2*A*B + B^2)*a*b^2*c*d^2 + (A^2 + 2*A*B + B^2)*a^2*b*d^3)*g^2*x^4 +
15*((A^2 + 2*A*B + B^2)*b^3*c^3 + 9*(A^2 + 2*A*B + B^2)*a*b^2*c^2*d + 9*(A^
```

```
2 + 2*A*B + B^2)*a^2*b*c*d^2 + (A^2 + 2*A*B + B^2)*a^3*d^3)*g^2*x^3 + 45*((
A^2 + 2*A*B + B^2)*a*b^2*c^3 + 3*(A^2 + 2*A*B + B^2)*a^2*b*c^2*d + (A^2 + 2
*A*B + B^2)*a^3*c*d^2)*g^2*x^2 + 45*((A^2 + 2*A*B + B^2)*a^2*b*c^3 + (A^2 +
 2*A*B + B^2)*a^3*c^2*d)*g^2*x + (30*(A*B + B^2)*b^3*d^3*g^2*n*x^6 + 30*(A*
B + B^2)*a^3*c^3*g^2*n - 6*((B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*g^2*n^2 - 15*((
A*B + B^2)*b^3*c*d^2 + (A*B + B^2)*a*b^2*d^3)*g^2*n)*x^5 - 15*((B^2*b^3*c^2
*d - B^2*a^2*b*d^3)*g^2*n^2 - 6*((A*B + B^2)*b^3*c^2*d + 3*(A*B + B^2)*a*b^
2*c*d^2 + (A*B + B^2)*a^2*b*d^3)*g^2*n)*x^4 - 10*((B^2*b^3*c^3 + 3*B^2*a*b^
2*c^2*d - 3*B^2*a^2*b*c*d^2 - B^2*a^3*d^3)*g^2*n^2 - 3*((A*B + B^2)*b^3*c^3
 + 9*(A*B + B^2)*a*b^2*c^2*d + 9*(A*B + B^2)*a^2*b*c*d^2 + (A*B + B^2)*a^3*
d^3)*g^2*n)*x^3 - 30*((B^2*a*b^2*c^3 - B^2*a^3*c*d^2)*g^2*n^2 - 3*((A*B + B
^2)*a*b^2*c^3 + 3*(A*B + B^2)*a^2*b*c^2*d + (A*B + B^2)*a^3*c*d^2)*g^2*n)*x
^2 - 30*((B^2*a^2*b*c^3 - B^2*a^3*c^2*d)*g^2*n^2 - 3*((A*B + B^2)*a^2*b*c^3
 + (A*B + B^2)*a^3*c^2*d)*g^2*n)*x)*log((b*x + a)/(d*x + c)))/(b*d*x^2 + a*
c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2
,x)
```

```
[Out] Timed out
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)^2\,(c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^
2,x)
```

```
[Out] int((a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^
2, x)
```

3.170 $\int (ag+bgx)(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=635

$$\frac{B^2(bc-ad)^3gi^2n^2x}{12b^2d}+\frac{B^2(bc-ad)^2gi^2n^2(c+dx)^2}{12bd^2}-\frac{B(bc-ad)^3gi^2n(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6b^3d}-\frac{B(b}{}$$

```
[Out] 1/12*B^2*(-a*d+b*c)^3*g*i^2*n^2*x/b^2/d+1/12*B^2*(-a*d+b*c)^2*g*i^2*n^2*(d*
x+c)^2/b/d^2-1/6*B*(-a*d+b*c)^3*g*i^2*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))
^n))/b^3/d-1/6*B*(-a*d+b*c)^2*g*i^2*n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))
^n))/b^3+1/4*B*(-a*d+b*c)^2*g*i^2*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n
))/b/d^2-1/6*B*(-a*d+b*c)*g*i^2*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))
/d^2+1/12*(-a*d+b*c)^2*g*i^2*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^
3+1/6*(-a*d+b*c)*g*i^2*(b*x+a)^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/
b^2+1/4*g*i^2*(b*x+a)^2*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b-1/6*B
*(-a*d+b*c)^4*g*i^2*n*(A+B*n+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(
d*x+c))/b^3/d^2-1/12*B^2*(-a*d+b*c)^4*g*i^2*n^2*ln((b*x+a)/(d*x+c))/b^3/d^2
-1/4*B^2*(-a*d+b*c)^4*g*i^2*n^2*ln(d*x+c)/b^3/d^2-1/6*B^2*(-a*d+b*c)^4*g*i^
2*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^3/d^2
```

Rubi [A]
time = 0.44, antiderivative size = 635, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$, Rules used = {2561, 2383, 2381, 2384, 2354, 2438, 2373, 45, 2382, 12, 78}

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,
x]
```

```
[Out] (B^2*(b*c - a*d)^3*g*i^2*n^2*x)/(12*b^2*d) + (B^2*(b*c - a*d)^2*g*i^2*n^2*(
c + d*x)^2)/(12*b*d^2) - (B*(b*c - a*d)^3*g*i^2*n*(a + b*x)*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]))/(6*b^3*d) - (B*(b*c - a*d)^2*g*i^2*n*(a + b*x)^2*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^3) + (B*(b*c - a*d)^2*g*i^2*n*(
c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b*d^2) - (B*(b*c - a*
d)*g*i^2*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d^2) + ((
b*c - a*d)^2*g*i^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(1
2*b^3) + ((b*c - a*d)*g*i^2*(a + b*x)^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])^2)/(6*b^2) + (g*i^2*(a + b*x)^2*(c + d*x)^2*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])^2)/(4*b) - (B*(b*c - a*d)^4*g*i^2*n*(A + B*n + B*Log[
e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(6*b^3*d^2) - (
B^2*(b*c - a*d)^4*g*i^2*n^2*Log[(a + b*x)/(c + d*x)])/(12*b^3*d^2) - (B^2*(
b*c - a*d)^4*g*i^2*n^2*Log[c + d*x])/(4*b^3*d^2) - (B^2*(b*c - a*d)^4*g*i^2
*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(6*b^3*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (170c+170dx)^2(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(\frac{(-bc+ad)g(170c+170dx)^2\left(A+B\right.}{d}\right.$$

$$= \frac{(bg)\int (170c+170dx)^3\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{170d}$$

$$= -\frac{28900(bc-ad)g(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^2}$$

$$= -\frac{28900(bc-ad)g(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^2}$$

$$= -\frac{28900(bc-ad)g(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^2}$$

$$= -\frac{28900(bc-ad)g(c+dx)^3\left(A+B\log\left(\right.\right.}{3d^2}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{7225B(bc-a}{}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{14450B^2(bc-}{}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{14450B^2(bc-}{}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{7225B^2(bc-}{3b^2d}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{7225B^2(bc-}{3b^2d}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{7225B^2(bc-}{3b^2d}$$

<u>Mathematica</u> [A]
time = 0.42, size = 713, normalized size = 1.12

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2,x]
```

```
[Out] (g*i^2*(-4*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
 + 3*b*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (4*B*(b*c - a
*d)^2*n*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a
 + b*x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2
*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c - a*d)^2*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c
+ d*x] - B*(b*c - a*d)^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x)
)/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3 - (B*(b
*c - a*d)*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c -
a*d)*Log[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2
 + 2*(b*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a
+ b*x)/(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
 + 6*(b*c - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*
B*(b*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a +
 b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)])))/b^3))/(12*d^2)
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int (bgx+ag)\,(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 2166 vs. 2(577) = 1154.
time = 0.80, size = 2166, normalized size = 3.41

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] -1/2*A*B*b*d^2*g*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*A^2*b*d^2
*g*x^4 - 4/3*A*B*b*c*d*g*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2/3*A
*B*a*d^2*g*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2/3*A^2*b*c*d*g*x^3
 - 1/3*A^2*a*d^2*g*x^3 - A*B*b*c^2*g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^
n*e) - 2*A*B*a*c*d*g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/2*A^2*b
*c^2*g*x^2 - A^2*a*c*d*g*x^2 + 1/12*A*B*b*d^2*g*n*(6*a^4*log(b*x + a)/b^4 -
 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a
```

```
^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 2/3*A*B*b*c*d*g*n*(2*
a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 -
2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 1/3*A*B*a*d^2*g*n*(2*a^3*log(b*x + a)
/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2
*d^2)*x)/(b^2*d^2)) + A*B*b*c^2*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c
)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a*c*d*g*n*(a^2*log(b*x + a)/b^2 - c^2*
log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 2*A*B*a*c^2*g*n*(a*log(b*x + a)/b
 - c*log(d*x + c)/d) - 2*A*B*a*c^2*g*x*log((b*x/(d*x + c) + a/(d*x + c))^n*
e) - A^2*a*c^2*g*x + 1/12*(7*a^2*b*c^2*d^2*g*n^2 - 2*a^3*c*d^3*g*n^2 + (n^2
 - 2*n)*b^3*c^4*g - 2*(3*n^2 - 4*n)*a*b^2*c^3*d*g)*B^2*log(d*x + c)/(b^2*d^
2) - 1/6*(b^4*c^4*g*n^2 - 4*a*b^3*c^3*d*g*n^2 + 6*a^2*b^2*c^2*d^2*g*n^2 - 4
*a^3*b*c*d^3*g*n^2 + a^4*d^4*g*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c -
a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^2) - 1/12*(3*B^2*
b^4*d^4*g*x^4 + 2*(a*b^3*d^4*g*(n + 2) - b^4*c*d^3*g*(n - 4))*B^2*x^3 + ((n
^2 - 5*n + 6)*b^4*c^2*d^2*g - 2*(n^2 - 2*n - 6)*a*b^3*c*d^3*g + (n^2 + n)*a
^2*b^2*d^4*g)*B^2*x^2 - (6*a^2*b^2*c^2*d^2*g*n^2 - 4*a^3*b*c*d^3*g*n^2 + a^
4*d^4*g*n^2)*B^2*log(b*x + a)^2 - 2*(b^4*c^4*g*n^2 - 4*a*b^3*c^3*d*g*n^2)*B
^2*log(b*x + a)*log(d*x + c) + (b^4*c^4*g*n^2 - 4*a*b^3*c^3*d*g*n^2)*B^2*lo
g(d*x + c)^2 + ((3*n^2 - 2*n)*b^4*c^3*d*g - (7*n^2 + 4*n - 12)*a*b^3*c^2*d^
2*g + (5*n^2 + 8*n)*a^2*b^2*c*d^3*g - (n^2 + 2*n)*a^3*b*d^4*g)*B^2*x - (2*a
*b^3*c^3*d*g*n^2 - (n^2 + 12*n)*a^2*b^2*c^2*d^2*g - 2*(n^2 - 4*n)*a^3*b*c*d
^3*g + (n^2 - 2*n)*a^4*d^4*g)*B^2*log(b*x + a) + (3*B^2*b^4*d^4*g*x^4 + 12*
B^2*a*b^3*c^2*d^2*g*x + 4*(2*b^4*c*d^3*g + a*b^3*d^4*g)*B^2*x^3 + 6*(b^4*c^
2*d^2*g + 2*a*b^3*c*d^3*g)*B^2*x^2)*log((b*x + a)^n)^2 + (3*B^2*b^4*d^4*g*x
^4 + 12*B^2*a*b^3*c^2*d^2*g*x + 4*(2*b^4*c*d^3*g + a*b^3*d^4*g)*B^2*x^3 + 6
*(b^4*c^2*d^2*g + 2*a*b^3*c*d^3*g)*B^2*x^2)*log((d*x + c)^n)^2 + (6*B^2*b^4
*d^4*g*x^4 + 2*(a*b^3*d^4*g*(n + 4) - b^4*c*d^3*g*(n - 8))*B^2*x^3 - (b^4*c
^2*d^2*g*(5*n - 12) - 4*a*b^3*c*d^3*g*(n + 6) - a^2*b^2*d^4*g*n)*B^2*x^2 -
2*(2*a*b^3*c^2*d^2*g*(n - 6) + b^4*c^3*d*g*n - 4*a^2*b^2*c*d^3*g*n + a^3*b*
d^4*g*n)*B^2*x + 2*(6*a^2*b^2*c^2*d^2*g*n - 4*a^3*b*c*d^3*g*n + a^4*d^4*g*n
)*B^2*log(b*x + a) + 2*(b^4*c^4*g*n - 4*a*b^3*c^3*d*g*n)*B^2*log(d*x + c))*
log((b*x + a)^n) - (6*B^2*b^4*d^4*g*x^4 + 2*(a*b^3*d^4*g*(n + 4) - b^4*c*d^
3*g*(n - 8))*B^2*x^3 - (b^4*c^2*d^2*g*(5*n - 12) - 4*a*b^3*c*d^3*g*(n + 6)
- a^2*b^2*d^4*g*n)*B^2*x^2 - 2*(2*a*b^3*c^2*d^2*g*(n - 6) + b^4*c^3*d*g*n -
 4*a^2*b^2*c*d^3*g*n + a^3*b*d^4*g*n)*B^2*x + 2*(6*a^2*b^2*c^2*d^2*g*n - 4*
a^3*b*c*d^3*g*n + a^4*d^4*g*n)*B^2*log(b*x + a) + 2*(b^4*c^4*g*n - 4*a*b^3*
c^3*d*g*n)*B^2*log(d*x + c) + 2*(3*B^2*b^4*d^4*g*x^4 + 12*B^2*a*b^3*c^2*d^2
*g*x + 4*(2*b^4*c*d^3*g + a*b^3*d^4*g)*B^2*x^3 + 6*(b^4*c^2*d^2*g + 2*a*b^3
*c*d^3*g)*B^2*x^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d^2)
```

Fricas [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")

[Out] -1/12*(3*B^2*b*d^2*g*n^2*x^4 + 12*B^2*a*c^2*g*n^2*x + 4*(2*B^2*b*c*d + B^2*a*d^2)*g*n^2*x^3 + 6*(B^2*b*c^2 + 2*B^2*a*c*d)*g*n^2*x^2)*log((b*x + a)/(d*x + c))^2 + integral(-1/6*(6*(A^2 + 2*A*B + B^2)*b^2*d^3*g*x^5 + 6*(A^2 + 2*A*B + B^2)*a^2*c^3*g + 6*(3*(A^2 + 2*A*B + B^2)*b^2*c*d^2 + 2*(A^2 + 2*A*B + B^2)*a*b*d^3)*g*x^4 + 6*(3*(A^2 + 2*A*B + B^2)*b^2*c^2*d + 6*(A^2 + 2*A*B + B^2)*a*b*c*d^2 + (A^2 + 2*A*B + B^2)*a^2*d^3)*g*x^3 + 6*((A^2 + 2*A*B + B^2)*b^2*c^3 + 6*(A^2 + 2*A*B + B^2)*a*b*c^2*d + 3*(A^2 + 2*A*B + B^2)*a^2*c*d^2)*g*x^2 + 6*(2*(A^2 + 2*A*B + B^2)*a*b*c^3 + 3*(A^2 + 2*A*B + B^2)*a^2*c^2*d)*g*x + (12*(A*B + B^2)*b^2*d^3*g*n*x^5 + 12*(A*B + B^2)*a^2*c^3*g*n - 3*((B^2*b^2*c*d^2 - B^2*a*b*d^3)*g*n^2 - 4*(3*(A*B + B^2)*b^2*c*d^2 + 2*(A*B + B^2)*a*b*d^3)*g*n)*x^4 - 4*((2*B^2*b^2*c^2*d - B^2*a*b*c*d^2 - B^2*a^2*d^3)*g*n^2 - 3*(3*(A*B + B^2)*b^2*c^2*d + 6*(A*B + B^2)*a*b*c*d^2 + (A*B + B^2)*a^2*d^3)*g*n)*x^3 - 6*((B^2*b^2*c^3 + B^2*a*b*c^2*d - 2*B^2*a^2*c*d^2)*g*n^2 - 2*((A*B + B^2)*b^2*c^3 + 6*(A*B + B^2)*a*b*c^2*d + 3*(A*B + B^2)*a^2*c*d^2)*g*n)*x^2 - 12*((B^2*a*b*c^3 - B^2*a^2*c^2*d)*g*n^2 - (2*(A*B + B^2)*a*b*c^3 + 3*(A*B + B^2)*a^2*c^2*d)*g*n)*x)*log((b*x + a)/(d*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$gi^2\left(\int A^2ac^2\,dx+\int A^2ad^2x^2\,dx+\int A^2bc^2x\,dx+\int A^2bd^2x^3\,dx+\int B^2ac^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx+\int 2ABac^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx+\int 2A^2acdx\,dx+\int 2A^2bcdx^2\,dx+\int B^2ad^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx+\int B^2bc^2x\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx+\int B^2bd^2x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx+\int 2ABad^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx+\int 2ABbc^2x\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx+\int 2ABbd^2x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx+\int 2B^2acdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx+\int 2B^2bcdx^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2dx+\int 4ABacdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx+\int 4ABbcdx^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)

[Out] g*i**2*(Integral(A**2*a*c**2, x) + Integral(A**2*a*d**2*x**2, x) + Integral(A**2*b*c**2*x, x) + Integral(A**2*b*d**2*x**3, x) + Integral(B**2*a*c**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(2*A*B*a*c**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral(2*A**2*a*c*d*x, x) + Integral(2*A**2*b*c*d*x**2, x) + Integral(B**2*a*d**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(B**2*b*c**2*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(B**2*b*d**2*x**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(2*A*B*a*d**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral(2*A*B*b*c**2*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral(2*A*B*b*d**2*x**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral(2*B**2*a*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(2*B**2*b*c*d*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(4*A*B*a*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral(4*A*B*b*c*d*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x))

Giac [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(I*d*x + I*c)^2*(B*log(((b*x + a)/(d*x + c))^n*e) +
 A)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)\,\left(c\,i+d\,i\,x\right)^2\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,
x)
```

```
[Out] int((a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,
 x)
```

3.171 $\int (ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \, dx$

Optimal. Leaf size=361

$$\frac{B^2(bc-ad)^2i^2n^2x}{3b^2}-\frac{2B(bc-ad)^2i^2n(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^3}-\frac{B(bc-ad)i^2n(c+dx)^2\left(A+B\log\right.}{3bd}$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*i^2*n^2*x/b^2-2/3*B*(-a*d+b*c)^2*i^2*n*(b*x+a)*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))/b^3-1/3*B*(-a*d+b*c)*i^2*n*(d*x+c)^2*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))/b/d+1/3*i^2*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/
d+1/3*B^2*(-a*d+b*c)^3*i^2*n^2*ln((b*x+a)/(d*x+c))/b^3/d+B^2*(-a*d+b*c)^3*i
^2*n^2*ln(d*x+c)/b^3/d+2/3*B*(-a*d+b*c)^3*i^2*n*(A+B*ln(e*((b*x+a)/(d*x+c))
^n))*ln(1-b*(d*x+c)/d/(b*x+a))/b^3/d-2/3*B^2*(-a*d+b*c)^3*i^2*n^2*polylog(2
,b*(d*x+c)/d/(b*x+a))/b^3/d
```

Rubi [A]
time = 0.25, antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {2551, 2356, 2389, 2379, 2438, 2351, 31, 46}

$$-\frac{2B^2i^2n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{3b^3d}+\frac{2Bi^2n(bc-ad)^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3d}-\frac{2Bi^2n(a+bx)(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3}-\frac{Bi^2n(c+dx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3bd}+\frac{i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3d}+\frac{B^2i^2n^2(bc-ad)^3\log\left(\frac{a+bx}{c+dx}\right)}{3b^3d}+\frac{B^2i^2n^2(bc-ad)^3\log(c+dx)}{b^3d}+\frac{B^2i^2n^2x(bc-ad)^2}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (B^2*(b*c - a*d)^2*i^2*n^2*x)/(3*b^2) - (2*B*(b*c - a*d)^2*i^2*n*(a + b*x)*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3) - (B*(b*c - a*d)*i^2*n*(c +
 d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*d) + (i^2*(c + d*x)^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*d) + (B^2*(b*c - a*d)^3*i^2*n^
2*Log[(a + b*x)/(c + d*x)])/(3*b^3*d) + (B^2*(b*c - a*d)^3*i^2*n^2*Log[c +
d*x])/(b^3*d) + (2*B*(b*c - a*d)^3*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3
*i^2*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(3*b^3*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2551

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(m +
1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c -
 a*d, 0] && IntegersQ[m, p] && EqQ[d*f - c*g, 0] && (GtQ[p, 0] || LtQ[m, -1
])
```

Rubi steps

$$\int (171c+171dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{9747(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(2Bn)\int}{}$$

$$= \frac{9747(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(19494B}{}$$

$$= \frac{9747(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(19494B}{}$$

$$= \frac{9747(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(19494B}{}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} - \frac{9747B(bc-ad)n(c+}{}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} - \frac{19494B^2(bc-ad)^2n(a}{b^3}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} - \frac{19494B^2(bc-ad)^2n(a}{b^3}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^2}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^2}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^2}$$

Mathematica [A]

time = 0.16, size = 303, normalized size = 0.84

$$\frac{i^2\left((c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - \frac{B(bc-ad)n\left(2Abd(bc-ad)x-B(bc-ad)n(bdx+(bc-ad)\log(a+bx))+2Bd(bc-ad)(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+b^2(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2(bc-ad)^2\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-2B(bc-ad)^2n\log(c+dx)-B(bc-ad)^2n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{b^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (i^2*((c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a + b*
x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2*(c +
 d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c - a*d)^2*Log[a + b*
```

```
x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c + d*x
] - B*(b*c - a*d)^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*
c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3))/(3*d)
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int (dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1207 vs. $2(327) = 654$.
time = 0.74, size = 1207, normalized size = 3.34

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] -2/3*A*B*d^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/3*A^2*d^2*x^3 -
 2*A*B*c*d*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - A^2*c*d*x^2 - 1/3*A
*B*d^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b
*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 2*A*B*c*d*n*(a^2*log(b*x
+ a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 2*A*B*c^2*n*(a*log
(b*x + a)/b - c*log(d*x + c)/d) - 2*A*B*c^2*x*log((b*x/(d*x + c) + a/(d*x +
 c))^n*e) - A^2*c^2*x + 1/3*(5*a*b*c^2*d*n^2 - 2*a^2*c*d^2*n^2 - (3*n^2 - 2
*n)*b^2*c^3)*B^2*log(d*x + c)/(b^2*d) + 2/3*(b^3*c^3*n^2 - 3*a*b^2*c^2*d*n^
2 + 3*a^2*b*c*d^2*n^2 - a^3*d^3*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c -
 a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d) - 1/3*(2*B^2*b^
3*c^3*n^2*log(b*x + a)*log(d*x + c) - B^2*b^3*c^3*n^2*log(d*x + c)^2 + B^2*
b^3*d^3*x^3 - (b^3*c*d^2*(n - 3) - a*b^2*d^3*n)*B^2*x^2 - (3*a*b^2*c^2*d*n^
2 - 3*a^2*b*c*d^2*n^2 + a^3*d^3*n^2)*B^2*log(b*x + a)^2 + ((n^2 - 4*n + 3)*
b^3*c^2*d - 2*(n^2 - 3*n)*a*b^2*c*d^2 + (n^2 - 2*n)*a^2*b*d^3)*B^2*x - (2*(
2*n^2 - 3*n)*a*b^2*c^2*d - (7*n^2 - 6*n)*a^2*b*c*d^2 + (3*n^2 - 2*n)*a^3*d^
3)*B^2*log(b*x + a) + (B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*b^3*c^
2*d*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*
b^3*c^2*d*x)*log((d*x + c)^n)^2 + (2*B^2*b^3*d^3*x^3 - 2*B^2*b^3*c^3*n*log(
d*x + c) - (b^3*c*d^2*(n - 6) - a*b^2*d^3*n)*B^2*x^2 - 2*(b^3*c^2*d*(2*n -
3) - 3*a*b^2*c*d^2*n + a^2*b*d^3*n)*B^2*x + 2*(3*a*b^2*c^2*d*n - 3*a^2*b*c*
d^2*n + a^3*d^3*n)*B^2*log(b*x + a))*log((b*x + a)^n) - (2*B^2*b^3*d^3*x^3
```

```
- 2*B^2*b^3*c^3*n*log(d*x + c) - (b^3*c*d^2*(n - 6) - a*b^2*d^3*n)*B^2*x^2
- 2*(b^3*c^2*d*(2*n - 3) - 3*a*b^2*c*d^2*n + a^2*b*d^3*n)*B^2*x + 2*(3*a*b^
2*c^2*d*n - 3*a^2*b*c*d^2*n + a^3*d^3*n)*B^2*log(b*x + a) + 2*(B^2*b^3*d^3*
x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*b^3*c^2*d*x)*log((b*x + a)^n))*log((d*x +
 c)^n))/(b^3*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] -1/3*(B^2*d^2*n^2*x^3 + 3*B^2*c*d*n^2*x^2 + 3*B^2*c^2*n^2*x)*log((b*x + a)/
(d*x + c))^2 + integral(-1/3*(3*(A^2 + 2*A*B + B^2)*b*d^3*x^4 + 3*(A^2 + 2*
A*B + B^2)*a*c^3 + 3*(3*(A^2 + 2*A*B + B^2)*b*c*d^2 + (A^2 + 2*A*B + B^2)*a
*d^3)*x^3 + 9*((A^2 + 2*A*B + B^2)*b*c^2*d + (A^2 + 2*A*B + B^2)*a*c*d^2)*x
^2 + 3*((A^2 + 2*A*B + B^2)*b*c^3 + 3*(A^2 + 2*A*B + B^2)*a*c^2*d)*x + 2*(3
*(A*B + B^2)*b*d^3*n*x^4 + 3*(A*B + B^2)*a*c^3*n - ((B^2*b*c*d^2 - B^2*a*d^
3)*n^2 - 3*(3*(A*B + B^2)*b*c*d^2 + (A*B + B^2)*a*d^3)*n)*x^3 - 3*((B^2*b*c
^2*d - B^2*a*c*d^2)*n^2 - 3*((A*B + B^2)*b*c^2*d + (A*B + B^2)*a*c*d^2)*n)*
x^2 - 3*((B^2*b*c^3 - B^2*a*c^2*d)*n^2 - ((A*B + B^2)*b*c^3 + 3*(A*B + B^2)
*a*c^2*d)*n)*x)*log((b*x + a)/(d*x + c)))/(b*d*x^2 + a*c + (b*c + a*d)*x),
x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$i^{2}\left(\int A^{2}c^{2}\, dx + \int A^{2}d^{2}x^{2}\, dx + \int B^{2}c^{2}\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)}^{2}\, dx + \int 2ABc^{2}\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)}\, dx + \int 2A^{2}cdx\, dx + \int B^{2}d^{2}x^{2}\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)}^{2}\, dx + \int 2ABd^{2}x^{2}\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)}\, dx + \int 2B^{2}cdx\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)}^{2}\, dx + \int 4ABcdx\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] i**2*(Integral(A**2*c**2, x) + Integral(A**2*d**2*x**2, x) + Integral(B**2*
c**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(2*A*B*c**2*l
og(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral(2*A**2*c*d*x, x) + In
tegral(B**2*d**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Inte
gral(2*A*B*d**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral
(2*B**2*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(4*A
*B*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (c\,i+d\,i\,x)^2\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

3.172 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=572

$$-\frac{Bd(bc-ad)i^2n(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g}+\frac{d(bc-ad)i^2(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g}+\frac{i^2(c+\cdots}{}$$

```
[Out] -B*d*(-a*d+b*c)*i^2*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/g+d*(-a*d
+b*c)*i^2*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^3/g+1/2*i^2*(d*x+c)^2
*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b/g+2*B*(-a*d+b*c)^2*i^2*n*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/b^3/g+B^2*(-a*d+b*c)^2*i^2*n^2*
ln(d*x+c)/b^3/g+B*(-a*d+b*c)^2*i^2*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b
*(d*x+c)/d/(b*x+a))/b^3/g-(-a*d+b*c)^2*i^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^
2*ln(1-b*(d*x+c)/d/(b*x+a))/b^3/g+2*B^2*(-a*d+b*c)^2*i^2*n^2*polylog(2,d*(b
*x+a)/b/(d*x+c))/b^3/g-B^2*(-a*d+b*c)^2*i^2*n^2*polylog(2,b*(d*x+c)/d/(b*x+
a))/b^3/g+2*B*(-a*d+b*c)^2*i^2*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,
b*(d*x+c)/d/(b*x+a))/b^3/g+2*B^2*(-a*d+b*c)^2*i^2*n^2*polylog(3,b*(d*x+c)/d
/(b*x+a))/b^3/g
```

Rubi [A]
time = 0.52, antiderivative size = 572, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 11, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.244$, Rules used = {2561, 2389, 2379, 2421, 6724, 2355, 2354, 2438, 2356, 2351, 31}

$$\frac{2Bi^2n(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g}+\frac{2B^2i^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^3g}-\frac{B^2i^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g}+\frac{2B^2i^2n^2(bc-ad)^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g}+\frac{di^2(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^3g}-\frac{Bdi^2n(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g}+\frac{2Bi^2n(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g}-\frac{i^2(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^3g}+\frac{Bi^2n(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g}+\frac{i^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2bg}+\frac{B^2i^2n^2(bc-ad)^2\log(c+dx)}{b^3g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
),x]
```

```
[Out] -((B*d*(b*c - a*d)*i^2*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(b^3*g)) + (d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2)/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)
/(2*b*g) + (2*B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*
Log[(b*c - a*d)/(b*(c + d*x))])/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*n^2*Log[c
+ d*x])/(b^3*g) + (B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) - ((b*c - a*d)^2*i^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])
/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*
x))])/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2*PolyLog[2, (b*(c + d*x))/(d*(a +
 b*x))])/(b^3*g) + (2*B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c - a*
d)^2*i^2*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
```

```
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(172c+172dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{29584d(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{172d(17\ldots}{\ldots}\right.$$

$$= \frac{\left(29584(bc-ad)^2\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx}{b^2} + \frac{(172d)\int(17\ldots}{\ldots}$$

$$= \frac{29584d(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{14792(c+d\ldots}{\ldots}$$

$$= \frac{29584d(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{14792(c+d\ldots}{\ldots}$$

$$= \frac{29584d(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{14792(c+d\ldots}{\ldots}$$

$$= \frac{29584d(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{14792(c+d\ldots}{\ldots}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} + \frac{59168aBd(bc-ad)n\log(a+\ldots}{b^3g\ldots}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584B^2d(bc-ad)n(a+bx)\ldots}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584B^2d(bc-ad)n(a+bx)\ldots}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584B^2d(bc-ad)n(a+bx)\ldots}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a\ldots}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a\ldots}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a\ldots}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a\ldots}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a\ldots}{b^3g}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1659 vs. 2(572) = 1144.
time = 1.97, size = 1659, normalized size = 2.90

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x),x]
```

```
[Out] (i^2*(6*b*d*(2*b*c - a*d)*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log
[(a + b*x)/(c + d*x)])^2 + 3*b^2*d^2*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 6*(b*c - a*d)^2*Log[a + b*x]*(A + B
*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 - 12*b*B*
c*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(
a*d*Log[a/b + x]^2 - 2*a*d*Log[a/b + x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*
d + Log[c/d + x]*(b*c + a*d*Log[a + b*x] - a*d*Log[(d*(a + b*x))/(-(b*c) +
a*d)]) + (-(b*d*x) + a*d*Log[a + b*x])*Log[(a + b*x)/(c + d*x)]) - 2*a*d*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 6*b^2*B*c^2*n*(A + B*Log[e*((a + b*x
)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[a/b + x]^2 - 2*Log[a +
 b*x]*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) - 2*(Log[c/d
 + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a
*d)])) + 3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c
 + d*x)])*(-4*a*d^2*(a + b*x)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^
2 + 4*a*b*d*(c + d*x)*(-1 + Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^
2*Log[a/b + x] - 2*a^2*Log[a + b*x]) - 2*d^2*(b*x*(-2*a + b*x) + 2*a^2*Log[
a + b*x])*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) + b^2*(d
*x*(-2*c + d*x) - 2*d^2*x^2*Log[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*
(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])) + 4*b*B^2*c*n^2*(Log[(a + b*x)/(c + d*x)]*(-(a*d*Log[(a + b*
x)/(c + d*x)]^2) + 6*(b*c - a*d)*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*d*Log[(
a + b*x)/(c + d*x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c + b*d*x)])) + 6*(b*c
- a*d + a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)
)] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) - B^2*n^2*(6*b^2*c^2*Lo
g[(b*(b*c - a*d))/(c + d*x)] + 6*a^2*d^2*Log[(b*(b*c - a*d))/(c + d*x)] - 1
2*a*b*c*d*Log[(b^2*(b*c - a*d))/(c + d*x)] + 6*a*b*c*d*Log[(a + b*x)/(c + d
*x)] - 6*a^2*d^2*Log[(a + b*x)/(c + d*x)] + 6*b^2*c*d*x*Log[(a + b*x)/(c +
d*x)] - 6*a*b*d^2*x*Log[(a + b*x)/(c + d*x)] + 9*a^2*d^2*Log[(a + b*x)/(c +
 d*x)]^2 + 6*a*b*d^2*x*Log[(a + b*x)/(c + d*x)]^2 - 3*b^2*d^2*x^2*Log[(a +
b*x)/(c + d*x)]^2 - 2*a^2*d^2*Log[(a + b*x)/(c + d*x)]^3 + 6*b^2*c^2*Log[(a
 + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 12*a*b*c*d*Log[(a + b*x
)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 18*a^2*d^2*Log[(a + b*x)/(c +
 d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*a^2*d^2*Log[(a + b*x)/(c + d*x)]^
2*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*(b^2*c^2 + 2*a*b*c*d - 3*a^2*d^2 + 2*a
^2*d^2*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] -
```

```
12*a^2*d^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) - 6*b^2*B^2*c^2*n^2*(Lo
g[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - 2*Log[(a + b*x
)/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 2*PolyLog[3, (b*(c +
 d*x))/(d*(a + b*x))])))/(6*b^3*g)
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="maxima")
```

```
[Out] -2*A^2*c*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - 1/2*A^2*d^2*(2*a^2*log(b*x
+ a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) - A^2*c^2*log(b*g*x + a*g)/(b*g) -
1/2*(B^2*b^2*d^2*x^2 + 2*(2*b^2*c*d - a*b*d^2)*B^2*x + 2*(b^2*c^2 - 2*a*b*c
*d + a^2*d^2)*B^2*log(b*x + a))*log((d*x + c)^n)^2/(b^3*g) + integrate(-(2*
A*B*b^3*c^3 + B^2*b^3*c^3 + (2*A*B*b^3*d^3 + B^2*b^3*d^3)*x^3 + 3*(2*A*B*b^
3*c*d^2 + B^2*b^3*c*d^2)*x^2 + (B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B
^2*b^3*c^2*d*x + B^2*b^3*c^3)*log((b*x + a)^n)^2 + 3*(2*A*B*b^3*c^2*d + B^2
*b^3*c^2*d)*x + 2*(A*B*b^3*c^3 + B^2*b^3*c^3 + (A*B*b^3*d^3 + B^2*b^3*d^3)*
x^3 + 3*(A*B*b^3*c*d^2 + B^2*b^3*c*d^2)*x^2 + 3*(A*B*b^3*c^2*d + B^2*b^3*c^
2*d)*x)*log((b*x + a)^n) - (2*A*B*b^3*c^3 + 2*B^2*b^3*c^3 + (B^2*b^3*d^3*(n
 + 2) + 2*A*B*b^3*d^3)*x^3 + (6*A*B*b^3*c*d^2 + (2*b^3*c*d^2*(2*n + 3) - a*
b^2*d^3*n)*B^2)*x^2 + 2*(3*A*B*b^3*c^2*d + (2*a*b^2*c*d^2*n - a^2*b*d^3*n +
 3*b^3*c^2*d)*B^2)*x + 2*((b^3*c^2*d*n - 2*a*b^2*c*d^2*n + a^2*b*d^3*n)*B^2
*x + (a*b^2*c^2*d*n - 2*a^2*b*c*d^2*n + a^3*d^3*n)*B^2)*log(b*x + a) + 2*(B
^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*b^3*c^2*d*x + B^2*b^3*c^3)*log
((b*x + a)^n))*log((d*x + c)^n))/(b^4*d*g*x^2 + a*b^3*c*g + (b^4*c*g + a*b^
3*d*g)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="fricas")
```

```
[Out] integral(-((A^2 + 2*A*B + B^2)*d^2*x^2 + 2*(A^2 + 2*A*B + B^2)*c*d*x + (A^2
 + 2*A*B + B^2)*c^2 + (B^2*d^2*n^2*x^2 + 2*B^2*c*d*n^2*x + B^2*c^2*n^2)*log
((b*x + a)/(d*x + c))^2 + 2*((A*B + B^2)*d^2*n*x^2 + 2*(A*B + B^2)*c*d*n*x
+ (A*B + B^2)*c^2*n)*log((b*x + a)/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^2\left(\int \frac{A^2c^2}{a+bx}\,dx+\int \frac{A^2d^2x^2}{a+bx}\,dx+\int \frac{B^2c^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a+bx}\,dx+\int \frac{2ABc^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx+\int \frac{2A^2cdx}{a+bx}\,dx+\int \frac{B^2d^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a+bx}\,dx+\int \frac{2ABd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx+\int \frac{2B^2cdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a+bx}\,dx+\int \frac{4ABcdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g),x)
```

```
[Out] i**2*(Integral(A**2*c**2/(a + b*x), x) + Integral(A**2*d**2*x**2/(a + b*x),
 x) + Integral(B**2*c**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a + b*
x), x) + Integral(2*A*B*c**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b
*x), x) + Integral(2*A**2*c*d*x/(a + b*x), x) + Integral(B**2*d**2*x**2*log
(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a + b*x), x) + Integral(2*A*B*d**2
*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x) + Integral(2*B*
*2*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a + b*x), x) + Integra
l(4*A*B*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x))/g
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(b*g*x +
 a*g), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^2\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{a\,g+b\,g\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
),x)
```

```
[Out] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
), x)
```

3.173 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=472

$$-\frac{2B^2(bc-ad)i^2n^2(c+dx)}{b^2g^2(a+bx)}-\frac{2B(bc-ad)i^2n(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2(a+bx)}+\frac{d^2i^2(a+bx)\left(A+B\log\left(e\right.\right.}{b^3g^2}$$

```
[Out] -2*B^2*(-a*d+b*c)*i^2*n^2*(d*x+c)/b^2/g^2/(b*x+a)-2*B*(-a*d+b*c)*i^2*n*(d*x
+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/g^2/(b*x+a)+d^2*i^2*(b*x+a)*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))^2/b^3/g^2-(-a*d+b*c)*i^2*(d*x+c)*(A+B*ln(e*((b*x+a
)/(d*x+c))^n))^2/b^2/g^2/(b*x+a)+2*B*d*(-a*d+b*c)*i^2*n*(A+B*ln(e*((b*x+a)/
(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/b^3/g^2-2*d*(-a*d+b*c)*i^2*(A+B*ln(e*
((b*x+a)/(d*x+c))^n))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^3/g^2+2*B^2*d*(-a*d+b*c
)*i^2*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^3/g^2+4*B*d*(-a*d+b*c)*i^2*n*(A+
B*ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^3/g^2+4*B^2*d
*(-a*d+b*c)*i^2*n^2*polylog(3,b*(d*x+c)/d/(b*x+a))/b^3/g^2
```

Rubi [A]

time = 0.37, antiderivative size = 472, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2561, 2395, 2342, 2341, 2355, 2354, 2438, 2379, 2421, 6724}

$$\frac{4Bdi^2n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^2}+\frac{2B^2di^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^3g^2}+\frac{4B^2di^2n^2(bc-ad)\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^2}+\frac{d^2i^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^3g^2}+\frac{2Bdi^2n(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^2}-\frac{2di^2(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^3g^2}-\frac{i^2(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^2g^2(a+bx)}-\frac{2Bi^2n(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^2(a+bx)}-\frac{2B^2i^2n^2(c+dx)(bc-ad)}{b^2g^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)*i^2*n^2*(c + d*x))/(b^2*g^2*(a + b*x)) - (2*B*(b*c - a*
d)*i^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*g^2*(a + b*
x)) + (d^2*i^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2
) - ((b*c - a*d)*i^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b
^2*g^2*(a + b*x)) + (2*B*d*(b*c - a*d)*i^2*n*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(b^3*g^2) - (2*d*(b*c - a*d)*i^2*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))
])/(b^3*g^2) + (2*B^2*d*(b*c - a*d)*i^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))])/(b^3*g^2) + (4*B*d*(b*c - a*d)*i^2*n*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2) + (4*B^2*d*(b
*c - a*d)*i^2*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
```

```
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(173c+173dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{29929d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} + \frac{29929(bc-ad)^2}{b^2g}\right.$$

$$= \frac{(29929d^2)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{b^2g^2} + \frac{(59858d(bc-}{}$$

$$= \frac{29929d^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} - \frac{29929(bc-ad)^2 (A}{b^3g^2(a}$$

$$= \frac{29929d^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} - \frac{29929(bc-ad)^2 (A}{b^3g^2(a}$$

$$= \frac{29929d^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} - \frac{29929(bc-ad)^2 (A}{b^3g^2(a}$$

$$= \frac{29929d^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} - \frac{29929(bc-ad)^2 (A}{b^3g^2(a}$$

$$= -\frac{59858B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^2(a+bx)} + \frac{59858aB}{}$$

$$= -\frac{59858B^2d(bc-ad)\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^2} - \frac{59858}{}$$

$$= -\frac{59858B^2d(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^2} - \frac{59}{}$$

$$= -\frac{59858B^2(bc-ad)^2n^2}{b^3g^2(a+bx)} - \frac{59858B^2d(bc-ad)n^2\log(a+b}{b^3g^2}$$

$$= -\frac{59858B^2(bc-ad)^2n^2}{b^3g^2(a+bx)} - \frac{59858B^2d(bc-ad)n^2\log(a+b}{b^3g^2}$$

$$= -\frac{59858B^2(bc-ad)^2n^2}{b^3g^2(a+bx)} - \frac{59858B^2d(bc-ad)n^2\log(a+b}{b^3g^2}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 2834 vs. $2(472) = 944$.

time = 8.40, size = 2834, normalized size = 6.00

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^2,x]
```

```
[Out] (i^2*(3*b*d^2*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(
c + d*x)])^2 - (3*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n
*Log[(a + b*x)/(c + d*x)])^2)/(a + b*x) + 6*d*(b*c - a*d)*Log[a + b*x]*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + (6*b^
2*B*c^2*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d
*x)])*(-(d*(a + b*x)*Log[c/d + x]) + d*(a + b*x)*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] + (b*c - a*d)*(1 + Log[(a + b*x)/(c + d*x)])))/((b*c - a*d)*(a + b*
x)) + (3*b^2*B^2*c^2*n^2*(-2*b*c + 2*a*d - 2*d*(a + b*x)*Log[a + b*x] - 2*(
b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*d*(a + b*x)*Log[a + b*x]*Log[(a + b
*x)/(c + d*x)] - (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 + 2*d*(a + b*x)*Log
[c + d*x] - 2*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b
*d*x)] + d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
 - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(Log[
(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c
- a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c -
 a*d)*(a + b*x)) + 6*b*B*c*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*
Log[(a + b*x)/(c + d*x)])*(Log[a/b + x]^2 - 2*Log[a/b + x]*Log[a + b*x] - 2
*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[a + b*x]*((a*d)/(b*
c - a*d) + Log[c/d + x] + Log[(a + b*x)/(c + d*x)]) + 2*a*((a + b*x)^(-1) +
 Log[(a + b*x)/(c + d*x)]/(a + b*x) + (d*Log[c + d*x])/(-(b*c) + a*d)) - 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 6*B*d^2*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*((a + b*x)*(-1 + Log[a/b + x]
) - a*Log[a/b + x]^2 - (a^2*(1 + Log[a/b + x]))/(a + b*x) - b*(c/d + x)*(-1
 + Log[c/d + x]) + (a^2*Log[c/d + x])/(a + b*x) + (b*x - a^2/(a + b*x) - 2*
a*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(a + b*x)/(c + d*x)]) +
 (a^2*d*(Log[a + b*x] - Log[c + d*x]))/(-(b*c) + a*d) + 2*a*(Log[c/d + x]*L
og[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
+ (2*b*B^2*c*d*n^2*(6*b*c - 6*a*d - (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a
+ b*x) + 6*a*d*Log[a/b + x] + 3*b*c*Log[a/b + x]^2 - 3*a*d*Log[a/b + x]^2 -
 6*b*c*Log[c/d + x] + 6*b*c*Log[a + b*x] - 6*a*d*Log[a + b*x] - 6*b*c*Log[a
/b + x]*Log[a + b*x] + 6*a*d*Log[a/b + x]*Log[a + b*x] + 6*b*c*Log[c/d + x]
*Log[a + b*x] - 6*a*d*Log[c/d + x]*Log[a + b*x] - 6*b*c*Log[c/d + x]*Log[(d
*(a + b*x))/(-(b*c) + a*d)] + 6*a*d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] - (6*b*(b*c - a*d)*x*Log[(a + b*x)/(c + d*x)])/(a + b*x) + 6*b*c*Lo
g[a + b*x]*Log[(a + b*x)/(c + d*x)] - 6*a*d*Log[a + b*x]*Log[(a + b*x)/(c +
 d*x)] + 3*a*d*Log[(a + b*x)/(c + d*x)]^2 + 3*b*d*x*Log[(a + b*x)/(c + d*x)
]^2 - (3*b^2*x*(c + d*x)*Log[(a + b*x)/(c + d*x)]^2)/(a + b*x) - 3*b*c*Log[
```

```
(-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - a*d*Log[(a + b*x
)/(c + d*x)]^3 + 6*b*c*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*
x)] - 6*a*d*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*a*d
*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*(b*c - a*d +
 a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*
(b*c - a*d)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 6*b*c*Log[(a + b*x)/(c
+ d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 6*a*d*PolyLog[3, (d*(a +
b*x))/(b*(c + d*x))] + 6*b*c*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))]))/(b*c
 - a*d) - (B^2*d*n^2*(6*a^2*b*c*d + 6*a^2*b*d^2*x + 6*a^2*b*c*d*Log[(a + b*
x)/(c + d*x)] + 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)] + 12*a^2*b*c*d*Log[(
-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)] + 12*a*b^2*c*d*x*Log[
(-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)] + 6*a^2*b*c*d*Log[(a
 + b*x)/(c + d*x)]^2 + 3*a^3*d^2*Log[(a + b*x)/(c + d*x)]^2 + 9*a^2*b*d^2*x
*Log[(a + b*x)/(c + d*x)]^2 - 3*b^3*c*d*x^2*Log[(a + b*x)/(c + d*x)]^2 + 3*
a*b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)]^2 - 6*a^2*b*c*d*Log[(-(b*c) + a*d)/(
d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - 6*a*b^2*c*d*x*Log[(-(b*c) + a*d)
/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - 2*a^3*d^2*Log[(a + b*x)/(c + d
*x)]^3 - 2*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]^3 - 6*a*b^2*c^2*Log[(a + b*
x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*a^3*d^2*Log[(a + b*x)/(c +
 d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*b^3*c^2*x*Log[(a + b*x)/(c + d*x)
]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]*L
og[(b*c - a*d)/(b*c + b*d*x)] + 6*a^3*d^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b
*c - a*d)/(b*c + b*d*x)] + 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]^2*Log[(b*
c - a*d)/(b*c + b*d*x)] + 6*(a + b*x)*(-(b^2*c^2) - a^2*d^2 + 2*a^2*d^2*Log
[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + 12*a*b*c*d
*(a + b*x)*(-1 + Log[(a + b*x)/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a +
 b*x))] - 12*a^3*d^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] - 12*a^2*b*d^2
*x*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 12*a^2*b*c*d*PolyLog[3, (b*(c
+ d*x))/(d*(a + b*x))] + 12*a*b^2*c*d*x*PolyLog[3, (b*(c + d*x))/(d*(a + b*
x))]))/((b*c - a*d)*(a + b*x))))/(3*b^3*g^2)
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="maxima")
```

```
[Out] 2*A*B*c^2*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2)
 - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + A^2*(a^2/(b^4*g^2*x + a*b^3*g^2)
 - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*d^2 - 2*A^2*c*d*(a/(b^3*g^2*x
+ a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) + 2*A*B*c^2*log((b*x/(d*x + c) + a/(
d*x + c))^n*e)/(b^2*g^2*x + a*b*g^2) + A^2*c^2/(b^2*g^2*x + a*b*g^2) - (B^2
*b^2*d^2*x^2 + B^2*a*b*d^2*x - (b^2*c^2 - 2*a*b*c*d + a^2*d^2)*B^2 + 2*((b^
2*c*d - a*b*d^2)*B^2*x + (a*b*c*d - a^2*d^2)*B^2)*log(b*x + a))*log((d*x +
c)^n)^2/(b^4*g^2*x + a*b^3*g^2) + integrate(-(B^2*b^3*c^3 + (2*A*B*b^3*d^3
+ B^2*b^3*d^3)*x^3 + 3*(2*A*B*b^3*c*d^2 + B^2*b^3*c*d^2)*x^2 + (B^2*b^3*d^3
*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*b^3*c^2*d*x + B^2*b^3*c^3)*log((b*x + a)
^n)^2 + (4*A*B*b^3*c^2*d + 3*B^2*b^3*c^2*d)*x + 2*(B^2*b^3*c^3 + (A*B*b^3*d
^3 + B^2*b^3*d^3)*x^3 + 3*(A*B*b^3*c*d^2 + B^2*b^3*c*d^2)*x^2 + (2*A*B*b^3*
c^2*d + 3*B^2*b^3*c^2*d)*x)*log((b*x + a)^n) - 2*((B^2*b^3*d^3*(n + 1) + A*
B*b^3*d^3)*x^3 - (a*b^2*c^2*d*n - 2*a^2*b*c*d^2*n + a^3*d^3*n - b^3*c^3)*B^
2 + (3*A*B*b^3*c*d^2 + (2*a*b^2*d^3*n + 3*b^3*c*d^2)*B^2)*x^2 + (2*A*B*b^3*
c^2*d - (b^3*c^2*d*(n - 3) - 2*a*b^2*c*d^2*n)*B^2)*x + 2*((b^3*c*d^2*n - a*
b^2*d^3*n)*B^2*x^2 + 2*(a*b^2*c*d^2*n - a^2*b*d^3*n)*B^2*x + (a^2*b*c*d^2*n
 - a^3*d^3*n)*B^2)*log(b*x + a) + (B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 +
3*B^2*b^3*c^2*d*x + B^2*b^3*c^3)*log((b*x + a)^n))*log((d*x + c)^n))/(b^5*d
*g^2*x^3 + a^2*b^3*c*g^2 + (b^5*c*g^2 + 2*a*b^4*d*g^2)*x^2 + (2*a*b^4*c*g^2
 + a^2*b^3*d*g^2)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="fricas")
```

```
[Out] integral(-((A^2 + 2*A*B + B^2)*d^2*x^2 + 2*(A^2 + 2*A*B + B^2)*c*d*x + (A^2
 + 2*A*B + B^2)*c^2 + (B^2*d^2*n^2*x^2 + 2*B^2*c*d*n^2*x + B^2*c^2*n^2)*log
((b*x + a)/(d*x + c))^2 + 2*((A*B + B^2)*d^2*n*x^2 + 2*(A*B + B^2)*c*d*n*x
+ (A*B + B^2)*c^2*n)*log((b*x + a)/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*x +
 a^2*g^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2
,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(b*g*x +
 a*g)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^2\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{{\left(a\,g+b\,g\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^2,x)
```

```
[Out] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^2, x)
```

3.174 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=417

$$-\frac{2B^2di^2n^2(c+dx)}{b^2g^3(a+bx)}-\frac{B^2i^2n^2(c+dx)^2}{4bg^3(a+bx)^2}-\frac{2Bdi^2n(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)}-\frac{Bi^2n(c+dx)^2\left(A+B\log\right.}{2bg^3(a+bx}$$

```
[Out] -2*B^2*d*i^2*n^2*(d*x+c)/b^2/g^3/(b*x+a)-1/4*B^2*i^2*n^2*(d*x+c)^2/b/g^3/(b
*x+a)^2-2*B*d*i^2*n*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/g^3/(b*x+a)
-1/2*B*i^2*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/g^3/(b*x+a)^2-d*i^
2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^2/g^3/(b*x+a)-1/2*i^2*(d*x+c)
^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b/g^3/(b*x+a)^2-d^2*i^2*(A+B*ln(e*((b*
x+a)/(d*x+c))^n))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^3/g^3+2*B*d^2*i^2*n*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^3/g^3+2*B^2*d^2*i
^2*n^2*polylog(3,b*(d*x+c)/d/(b*x+a))/b^3/g^3
```

Rubi [A]

time = 0.37, antiderivative size = 417, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.156$, Rules used = {2561, 2380, 2342, 2341, 2379, 2421, 6724}

$$\frac{2Bd^2i^2n\,\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^3}+\frac{2B^2d^2i^2n^2\,\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^3}-\frac{d^2i^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^3g^3}-\frac{di^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^2g^3(a+bx)}-\frac{2Bdi^2n(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^3(a+bx)}-\frac{i^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2bg^3(a+bx)^2}-\frac{Bi^2n(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2bg^3(a+bx)^2}-\frac{2B^2di^2n^2(c+dx)}{b^2g^3(a+bx)}-\frac{B^2i^2n^2(c+dx)^2}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^3,x]
```

```
[Out] (-2*B^2*d*i^2*n^2*(c + d*x))/(b^2*g^3*(a + b*x)) - (B^2*i^2*n^2*(c + d*x)^2
)/(4*b*g^3*(a + b*x)^2) - (2*B*d*i^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(b^2*g^3*(a + b*x)) - (B*i^2*n*(c + d*x)^2*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(2*b*g^3*(a + b*x)^2) - (d*i^2*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])^2)/(b^2*g^3*(a + b*x)) - (i^2*(c + d*x)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b*g^3*(a + b*x)^2) - (d^2*i^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b
^3*g^3) + (2*B*d^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2,
(b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3) + (2*B^2*d^2*i^2*n^2*PolyLog[3, (b*
(c + d*x))/(d*(a + b*x))])/(b^3*g^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(174c+174dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx = \int \left(\frac{30276(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^3(a+bx)^3} + \frac{60552d}{}\right.$$

$$= \frac{(30276d^2)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{b^2g^3} + \frac{(60552d(bc-ad))}{}$$

$$= -\frac{15138(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{60552d(bc}{}$$

$$= -\frac{15138(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{60552d(bc}{}$$

$$= -\frac{15138(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{60552d(bc}{}$$

$$= -\frac{15138(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{60552d(bc}{}$$

$$= -\frac{15138B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^3(a+bx)^2} - \frac{90828B}{}$$

$$= -\frac{30276B^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^3} - \frac{15138B(bc-}{}$$

$$= -\frac{30276B^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^3} - \frac{30276B^2}{}$$

$$= -\frac{7569B^2(bc-ad)^2n^2}{b^3g^3(a+bx)^2} - \frac{75690B^2d(bc-ad)n^2}{b^3g^3(a+bx)} - \frac{75690}{}$$

$$= -\frac{7569B^2(bc-ad)^2n^2}{b^3g^3(a+bx)^2} - \frac{75690B^2d(bc-ad)n^2}{b^3g^3(a+bx)} - \frac{75690}{}$$

$$= -\frac{7569B^2(bc-ad)^2n^2}{b^3g^3(a+bx)^2} - \frac{75690B^2d(bc-ad)n^2}{b^3g^3(a+bx)} - \frac{75690}{}$$

Mathematica [**B**] Leaf count is larger than twice the leaf count of optimal. 4766 vs. $2(417) = 834$.

time = 10.86, size = 4766, normalized size = 11.43

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^3,x]
```

```
[Out] (d^2*i^2*Log[a + b*x]*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b
*x)/(c + d*x)]))^2)/(b^3*g^3) + (2*(-(A^2*b*c*d*i^2) + a*A^2*d^2*i^2 - 2*A*
b*B*c*d*i^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) +
 2*a*A*B*d^2*i^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x
)]) - b*B^2*c*d*i^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c +
d*x)])^2 + a*B^2*d^2*i^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/
(c + d*x)])^2))/(b^3*g^3*(a + b*x)) + (-(A^2*b^2*c^2*i^2) + 2*a*A^2*b*c*d*i
^2 - a^2*A^2*d^2*i^2 - 2*A*b^2*B*c^2*i^2*(Log[e*((a + b*x)/(c + d*x))^n] -
n*Log[(a + b*x)/(c + d*x)]) + 4*a*A*b*B*c*d*i^2*(Log[e*((a + b*x)/(c + d*x)
)^n] - n*Log[(a + b*x)/(c + d*x)]) - 2*a^2*A*B*d^2*i^2*(Log[e*((a + b*x)/(c
 + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - b^2*B^2*c^2*i^2*(Log[e*((a + b*
x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2 + 2*a*b*B^2*c*d*i^2*(Log[e
*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2 - a^2*B^2*d^2*i^2
*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)/(2*b^3*g^
3*(a + b*x)^2) + (2*B*c^2*i^2*n*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*
Log[(a + b*x)/(c + d*x)]))*(-1/8*((a/b + x)*(2*Log[a/b + x] + 4*Log[a/b + x
]^2))/((a + b*x)^3*Log[a/b + x]) - ((b*(c/d + x))/((-a + (b*c)/d)^3*(1 - (b
*(c/d + x))/(-a + (b*c)/d))) - ((b^2*(c/d + x)^2)/((-a + (b*c)/d)^4*(1 - (b
*(c/d + x))/(-a + (b*c)/d))^2) + (2*b*(c/d + x))/((-a + (b*c)/d)^3*(1 - (b*
(c/d + x))/(-a + (b*c)/d))))*Log[c/d + x] - Log[1 - (b*(c/d + x))/(-a + (b*
c)/d)]/(-a + (b*c)/d)^2)/(2*b) - (-Log[a/b + x] + Log[c/d + x] + Log[a/(c +
 d*x) + (b*x)/(c + d*x)])/(2*b*(a + b*x)^2)))/g^3 + (4*B*c*d*i^2*n*(A + B*(
Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]))*(-((1 + Log[a
/b + x])/(b^2*(a + b*x))) + (a*(1 + 2*Log[a/b + x]))/(4*b^2*(a + b*x)^2) -
(-(Log[c/d + x]/(b*(a + b*x))) + (d*(Log[a + b*x]/(b*c - a*d) - Log[c + d*x
]/(b*c - a*d)))/b)/b - (a*(Log[c/d + x] + (d*(a + b*x)*(b*c - a*d + d*(a +
b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]))/(b*c - a*d)^2))/(2*b^2*(a +
b*x)^2) - ((a + 2*b*x)*(-Log[a/b + x] + Log[c/d + x] + Log[a/(c + d*x) + (b
*x)/(c + d*x)]))/(2*b^2*(a + b*x)^2)))/g^3 + (2*B*d^2*i^2*n*(A + B*(Log[e*(
(a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]))*(Log[a/b + x]^2/(2*b
^3) + (2*a*(1 + Log[a/b + x]))/(b^3*(a + b*x)) - (a^2*(1 + 2*Log[a/b + x]))
/(4*b^3*(a + b*x)^2) + (2*a*(-(Log[c/d + x]/(b*(a + b*x))) + (d*(Log[a + b*
x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/b))/b^2 + (a^2*(Log[c/d + x] +
(d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*
x]))/(b*c - a*d)^2))/(2*b^3*(a + b*x)^2) + (((a*(3*a + 4*b*x))/(a + b*x)^2
+ 2*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[a/(c + d*x) + (b*x)/(
c + d*x)]))/(2*b^3) - ((Log[c/d + x]*Log[(a + b*x)/(a - (b*c)/d)])/b + Poly
```

```
Log[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/b^2))/g^3 + (B^2*c*d*i^2*n^2*(2*a*Lo
g[(a + b*x)/(c + d*x)]^2 - 4*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 - (4*(a +
 b*x)*(2*b*c - 2*a*d + 2*d*(a + b*x)*Log[a + b*x] + 2*(b*c - a*d)*Log[(a +
b*x)/(c + d*x)] + 2*d*(a + b*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*d
*(a + b*x)*Log[c + d*x] + 2*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c -
 a*d)/(b*c + b*d*x)] - d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(
c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - d*(
a + b*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*
d)])))/(b*c - a*d) + (a*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d
^2*(a + b*x)^2*Log[a + b*x] + 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)] + 4*
d*(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)/(c + d*x)] - 4*d^2*(a + b*x)^2*Log
[a + b*x]*Log[(a + b*x)/(c + d*x)] + 2*d^2*(a + b*x)^2*Log[c + d*x] - 4*d*(
a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x])
- 4*d^2*(a + b*x)^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)]
 + 2*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
 - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*d^2*(a + b*x)^2
*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log
[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(
b*c - a*d)^2))/(2*b^2*g^3*(a + b*x)^2) - (B^2*c^2*i^2*n^2*((b*c - a*d)^2 +
2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*(b*c - a*
d)^2*Log[(a + b*x)/(c + d*x)] + 4*d*(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)/
(c + d*x)] - 4*d^2*(a + b*x)^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + 2*(b
*c - a*d)^2*Log[(a + b*x)/(c + d*x)]^2 + 2*d^2*(a + b*x)^2*Log[c + d*x] - 4
*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*
x]) - 4*d^2*(a + b*x)^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d
*x)] + 2*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/
(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*d^2*(a + b*
x)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] +
 Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2,...
```

Maple [F]
time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx+ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="maxima")
```

```
[Out] A*B*c*d*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3
*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*
b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2
*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3)
) - 1/2*A*B*c^2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(
a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a
)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2
- 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A^2*d^2*((4*a*b*x + 3*a^2)/(b^5*g^3*
x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) + 2*(2*b*x +
 a)*A*B*c*d*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^4*g^3*x^2 + 2*a*b^3*g
^3*x + a^2*b^2*g^3) + (2*b*x + a)*A^2*c*d/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^
2*b^2*g^3) + A*B*c^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^3*g^3*x^2 +
2*a*b^2*g^3*x + a^2*b*g^3) + 1/2*A^2*c^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2
*b*g^3) + 1/2*(4*(b^2*c*d - a*b*d^2)*B^2*x + (b^2*c^2 + 2*a*b*c*d - 3*a^2*d
^2)*B^2 - 2*(B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x + B^2*a^2*d^2)*log(b*x + a))
*log((d*x + c)^n)^2/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + integrate
(-(3*B^2*b^3*c^2*d*x + B^2*b^3*c^3 + (2*A*B*b^3*d^3 + B^2*b^3*d^3)*x^3 + (2
*A*B*b^3*c*d^2 + 3*B^2*b^3*c*d^2)*x^2 + (B^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*
x^2 + 3*B^2*b^3*c^2*d*x + B^2*b^3*c^3)*log((b*x + a)^n)^2 + 2*(3*B^2*b^3*c^
2*d*x + B^2*b^3*c^3 + (A*B*b^3*d^3 + B^2*b^3*d^3)*x^3 + (A*B*b^3*c*d^2 + 3*
B^2*b^3*c*d^2)*x^2)*log((b*x + a)^n) + ((b^3*c^2*d*(n - 6) + 6*a*b^2*c*d^2*
n - 7*a^2*b*d^3*n)*B^2*x - 2*(A*B*b^3*d^3 + B^2*b^3*d^3)*x^3 + (a*b^2*c^2*d
*n + 2*a^2*b*c*d^2*n - 3*a^3*d^3*n - 2*b^3*c^3)*B^2 - 2*(A*B*b^3*c*d^2 - (b
^3*c*d^2*(2*n - 3) - 2*a*b^2*d^3*n)*B^2)*x^2 - 2*(B^2*b^3*d^3*n*x^3 + 3*B^2
*a*b^2*d^3*n*x^2 + 3*B^2*a^2*b*d^3*n*x + B^2*a^3*d^3*n)*log(b*x + a) - 2*(B
^2*b^3*d^3*x^3 + 3*B^2*b^3*c*d^2*x^2 + 3*B^2*b^3*c^2*d*x + B^2*b^3*c^3)*log
((b*x + a)^n))*log((d*x + c)^n))/(b^6*d*g^3*x^4 + a^3*b^3*c*g^3 + (b^6*c*g^
3 + 3*a*b^5*d*g^3)*x^3 + 3*(a*b^5*c*g^3 + a^2*b^4*d*g^3)*x^2 + (3*a^2*b^4*c
*g^3 + a^3*b^3*d*g^3)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="fricas")
```

```
[Out] integral(-((A^2 + 2*A*B + B^2)*d^2*x^2 + 2*(A^2 + 2*A*B + B^2)*c*d*x + (A^2
 + 2*A*B + B^2)*c^2 + (B^2*d^2*n^2*x^2 + 2*B^2*c*d*n^2*x + B^2*c^2*n^2)*log
```

```
((b*x + a)/(d*x + c))^2 + 2*((A*B + B^2)*d^2*n*x^2 + 2*(A*B + B^2)*c*d*n*x
+ (A*B + B^2)*c^2*n)*log((b*x + a)/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x
^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^2\left(\int \frac{A^2c^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{A^2d^2x^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{B^2c^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{2ABc^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{2A^2cdx}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{B^2d^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{2ABd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{2B^2cdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx+\int \frac{4ABcdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx\right)}{g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3
,x)
```

```
[Out] i**2*(Integral(A**2*c**2/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x
) + Integral(A**2*d**2*x**2/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3)
, x) + Integral(B**2*c**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a**3
+ 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + Integral(2*A*B*c**2*log(e*(
a/(c + d*x) + b*x/(c + d*x))**n)/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*
x**3), x) + Integral(2*A**2*c*d*x/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3
*x**3), x) + Integral(B**2*d**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n
)**2/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + Integral(2*A*B*d
**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**3 + 3*a**2*b*x + 3*a*b
**2*x**2 + b**3*x**3), x) + Integral(2*B**2*c*d*x*log(e*(a/(c + d*x) + b*x/
(c + d*x))**n)**2/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + Int
egral(4*A*B*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**3 + 3*a**2*b*
x + 3*a*b**2*x**2 + b**3*x**3), x))/g**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(b*g*x +
 a*g)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^2\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{{\left(a\,g+b\,g\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^3,x)
```

```
[Out] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^3, x)
```

3.175 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=157

$$-\frac{2B^2i^2n^2(c+dx)^3}{27(bc-ad)g^4(a+bx)^3}-\frac{2Bi^2n(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9(bc-ad)g^4(a+bx)^3}-\frac{i^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3(bc-ad)g^4(a+bx)^3}$$

```
[Out] -2/27*B^2*i^2*n^2*(d*x+c)^3/(-a*d+b*c)/g^4/(b*x+a)^3-2/9*B*i^2*n*(d*x+c)^3*
(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)/g^4/(b*x+a)^3-1/3*i^2*(d*x+c)^3*
(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)/g^4/(b*x+a)^3
```

Rubi [A]
time = 0.12, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {2561, 2342, 2341}

$$-\frac{i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)}-\frac{2Bi^2n(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^4(a+bx)^3(bc-ad)}-\frac{2B^2i^2n^2(c+dx)^3}{27g^4(a+bx)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^4,x]
```

```
[Out] (-2*B^2*i^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)*g^4*(a + b*x)^3) - (2*B*i^2*n*
(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)*g^4*(a +
 b*x)^3) - (i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*(b
*c - a*d)*g^4*(a + b*x)^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(175c+175dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4} dx = \int \left(\frac{30625(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^4(a+bx)^4} + \frac{61250d\right.$$

$$= \frac{(30625d^2)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2} dx}{b^2g^4} + \frac{(61250d(bc-ad))}{}$$

$$= -\frac{30625(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{30625d(bc}{}$$

$$= -\frac{30625(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{30625d(bc}{}$$

$$= -\frac{30625(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{30625d(bc}{}$$

$$= -\frac{30625(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{30625d(bc}{}$$

$$= -\frac{61250B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^3g^4(a+bx)^3} - \frac{61250B}{}$$

$$= -\frac{61250B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^3g^4(a+bx)^3} - \frac{61250B}{}$$

$$= -\frac{61250B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^3g^4(a+bx)^3} - \frac{61250B}{}$$

$$= -\frac{61250B^2(bc-ad)^2n^2}{27b^3g^4(a+bx)^3} - \frac{61250B^2d(bc-ad)n^2}{9b^3g^4(a+bx)^2} - \frac{6125}{9b^3g}$$

$$= -\frac{61250B^2(bc-ad)^2n^2}{27b^3g^4(a+bx)^3} - \frac{61250B^2d(bc-ad)n^2}{9b^3g^4(a+bx)^2} - \frac{6125}{9b^3g}$$

$$= -\frac{61250B^2(bc-ad)^2n^2}{27b^3g^4(a+bx)^3} - \frac{61250B^2d(bc-ad)n^2}{9b^3g^4(a+bx)^2} - \frac{6125}{9b^3g}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 1.44, size = 1415, normalized size = 9.01

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^4,x]
```

```
[Out] -1/54*(i^2*(18*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 54*
d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 54*d^2
*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 54*B
*d^2*n*(a + b*x)^2*(2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) +
2*d*(a + b*x)*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*d*(a
+ b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 2*B*n*(b*c - a
*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*n*(a + b*x)
*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLo
g[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*n*(a + b*x)*((2*Log[(d*(a + b*x))
/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])) + 27*B*d*n*(a + b*x)*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]) - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]) + 4*d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
 d*x] - 4*B*d*n*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*
x)*Log[c + d*x]) + B*n*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^
2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*n*(a
 + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) -
 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2,
 (b*(c + d*x))/(b*c - a*d)])) + B*n*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) - 36*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
 d*x] + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a
 + b*x)*Log[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*
d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d
*x]) + 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c -
a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c
 + d*x]) - 18*B*d^3*n*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
 + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B
*d^3*n*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Lo
g[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(b^3*(b*c - a*d)*g
^4*(a + b*x)^3)
```

Maple [**F**]

time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx+ag)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 5552 vs. $2(144) = 288$.
time = 0.75, size = 5552, normalized size = 35.36

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="maxima")
```

```
[Out] 1/9*A*B*d^2*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3
*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^
2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2
*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*
d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*c^
2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2
*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*lo
g(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4))
 + 1/9*A*B*c^2*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(
b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*
(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*
b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^
4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b
*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2
 - a^3*b*d^3)*g^4)) + 1/9*A*B*c*d*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^
2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d
^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^
2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3
*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d
^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*
b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*
d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) + 1/3*(3*b*x + a)*B^2*c*d*log((b*x
/(d*x + c) + a/(d*x + c))^n*e)^2/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3
*g^4*x + a^3*b^2*g^4) + 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*B^2*d^2*log((b*x/(d
*x + c) + a/(d*x + c))^n*e)^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^
4*x + a^3*b^3*g^4) + 1/54*(6*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11
*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2
)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^
4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d +
 a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2
```

```
*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3
*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) +
(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2
- a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*
d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a
^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x
+ 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)
 - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(
b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(
d*x + c))*n^2/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4
- a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 -
a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c
*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4
+ 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2*c^2 + 1/54*(6*n*((5*a*b^2*
c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c
^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*
g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*
c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a
^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c
^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x
+ c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4))*log((
b*x/(d*x + c) + a/(d*x + c))^n*e) + (19*a*b^3*c^3 - 189*a^2*b^2*c^2*d + 189
*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - 32*a*b^3*c*d^2 + 5*a^2*b^2*d^
3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3
*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*log(b*
x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3 + 3*
(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*log(
d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + 135*a^2*b^2*c*d^2 - 19*a^3*b*
d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*a*b^3*d^3)*x^3 +
 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*b*d^3
)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*a*b^3
*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*b^2*c*d^2 -
5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3
 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)
*log(b*x + a))*log(d*x + c))*n^2/(a^3*b^5*c^3*g^4 - 3*a^4*b^4*c^2*d*g^4 + 3
*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^4 - 3*a*b^7*c^2*d*g^4 + 3
*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 646 vs. $2(144) = 288$.

time = 0.40, size = 646, normalized size = 4.11

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="fricas")
```

```
[Out] 1/27*(9*(A^2 + 2*A*B + B^2)*b^3*c^3 - 9*(A^2 + 2*A*B + B^2)*a^3*d^3 + 2*(B^
2*b^3*c^3 - B^2*a^3*d^3)*n^2 + 3*(9*(A^2 + 2*A*B + B^2)*b^3*c*d^2 - 9*(A^2
+ 2*A*B + B^2)*a*b^2*d^3 + 2*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 + 6*((A*B
+ B^2)*b^3*c*d^2 - (A*B + B^2)*a*b^2*d^3)*n)*x^2 + 9*(B^2*b^3*d^3*n^2*x^3 +
 3*B^2*b^3*c*d^2*n^2*x^2 + 3*B^2*b^3*c^2*d*n^2*x + B^2*b^3*c^3*n^2)*log((b*
x + a)/(d*x + c))^2 + 6*((A*B + B^2)*b^3*c^3 - (A*B + B^2)*a^3*d^3)*n + 3*(
9*(A^2 + 2*A*B + B^2)*b^3*c^2*d - 9*(A^2 + 2*A*B + B^2)*a^2*b*d^3 + 2*(B^2*
b^3*c^2*d - B^2*a^2*b*d^3)*n^2 + 6*((A*B + B^2)*b^3*c^2*d - (A*B + B^2)*a^2
*b*d^3)*n)*x + 6*(B^2*b^3*c^3*n^2 + 3*(A*B + B^2)*b^3*c^3*n + (B^2*b^3*d^3*
n^2 + 3*(A*B + B^2)*b^3*d^3*n)*x^3 + 3*(B^2*b^3*c*d^2*n^2 + 3*(A*B + B^2)*b
^3*c*d^2*n)*x^2 + 3*(B^2*b^3*c^2*d*n^2 + 3*(A*B + B^2)*b^3*c^2*d*n)*x)*log(
(b*x + a)/(d*x + c)))/((b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*b^6*c - a^2*b^5*d)*
g^4*x^2 + 3*(a^2*b^5*c - a^3*b^4*d)*g^4*x + (a^3*b^4*c - a^4*b^3*d)*g^4)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^2\left(\int \frac{A^2c^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{A^2d^2x^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{B^2c^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{2ABc^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{2A^2cdx}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{B^2d^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{2ABd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{2B^2cdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{4ABcdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx\right)}{g^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4
,x)
```

```
[Out] i**2*(Integral(A**2*c**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x
**3 + b**4*x**4), x) + Integral(A**2*d**2*x**2/(a**4 + 4*a**3*b*x + 6*a**2*
b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(B**2*c**2*log(e*(a/(c
 + d*x) + b*x/(c + d*x))**n)**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a
*b**3*x**3 + b**4*x**4), x) + Integral(2*A*B*c**2*log(e*(a/(c + d*x) + b*x/
(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4
*x**4), x) + Integral(2*A**2*c*d*x/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 +
4*a*b**3*x**3 + b**4*x**4), x) + Integral(B**2*d**2*x**2*log(e*(a/(c + d*x)
 + b*x/(c + d*x))**n)**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x
**3 + b**4*x**4), x) + Integral(2*A*B*d**2*x**2*log(e*(a/(c + d*x) + b*x/(c
 + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x
**4), x) + Integral(2*B**2*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2
/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + I
ntegral(4*A*B*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**4 + 4*a**3*
b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x))/g**4
```

Giac [A]
time = 9.95, size = 176, normalized size = 1.12

$$\frac{1}{27}\left(\frac{9\,(dx+c)^3B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^2}{(bx+a)^3g^4}+\frac{6\,(B^2n^2+3\,ABn+3\,B^2n)(dx+c)^3\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)^3g^4}+\frac{(2\,B^2n^2+6\,ABn+6\,B^2n+9\,A^2+18\,AB+9\,B^2)(dx+c)^3}{(bx+a)^3g^4}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="giac")
```

```
[Out] 1/27*(9*(d*x + c)^3*B^2*n^2*log((b*x + a)/(d*x + c))^2/((b*x + a)^3*g^4) +
6*(B^2*n^2 + 3*A*B*n + 3*B^2*n)*(d*x + c)^3*log((b*x + a)/(d*x + c))/((b*x
+ a)^3*g^4) + (2*B^2*n^2 + 6*A*B*n + 6*B^2*n + 9*A^2 + 18*A*B + 9*B^2)*(d*x
 + c)^3/((b*x + a)^3*g^4))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 7.48, size = 1195, normalized size = 7.61

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^4,x)
```

```
[Out] - (x*(9*A^2*a*b*d^2*i^2 + 9*A^2*b^2*c*d*i^2 + 2*B^2*a*b*d^2*i^2*n^2 + 2*B^2
*b^2*c*d*i^2*n^2 + 6*A*B*a*b*d^2*i^2*n + 6*A*B*b^2*c*d*i^2*n) + x^2*(9*A^2*
b^2*d^2*i^2 + 2*B^2*b^2*d^2*i^2*n^2 + 6*A*B*b^2*d^2*i^2*n) + 3*A^2*a^2*d^2*
i^2 + 3*A^2*b^2*c^2*i^2 + (2*B^2*a^2*d^2*i^2*n^2)/3 + (2*B^2*b^2*c^2*i^2*n^
2)/3 + 3*A^2*a*b*c*d*i^2 + 2*A*B*a^2*d^2*i^2*n + 2*A*B*b^2*c^2*i^2*n + (2*B
^2*a*b*c*d*i^2*n^2)/3 + 2*A*B*a*b*c*d*i^2*n)/(9*a^3*b^3*g^4 + 9*b^6*g^4*x^3
 + 27*a^2*b^4*g^4*x + 27*a*b^5*g^4*x^2) - log(e*((a + b*x)/(c + d*x))^n)*((
a*(2*A*B*a*d^2*i^2 - B^2*a*d^2*i^2*n + B^2*b*c*d*i^2*n + 2*A*B*b*c*d*i^2) +
 x*(b*(2*A*B*a*d^2*i^2 - B^2*a*d^2*i^2*n + B^2*b*c*d*i^2*n + 2*A*B*b*c*d*i^
2) + 4*A*B*a*b*d^2*i^2 + 4*A*B*b^2*c*d*i^2 - 2*B^2*a*b*d^2*i^2*n + 2*B^2*b^
2*c*d*i^2*n) + 2*A*B*b^2*c^2*i^2 - 2*B^2*a^2*d^2*i^2*n + 6*A*B*b^2*d^2*i^2*
x^2 + 2*B^2*a*b*c*d*i^2*n)/(3*a^3*b^3*g^4 + 3*b^6*g^4*x^3 + 9*a^2*b^4*g^4*x
 + 9*a*b^5*g^4*x^2) + (2*B^2*d^3*i^2*(x*(b*((a*b^3*g^4*n*(a*d - b*c))/d + (
b^3*g^4*n*(a*d - b*c)*(3*a*d - b*c))/(2*d^2)) + (2*a*b^4*g^4*n*(a*d - b*c))
/d + (b^4*g^4*n*(a*d - b*c)*(3*a*d - b*c))/d^2) + a*((a*b^3*g^4*n*(a*d - b*
c))/d + (b^3*g^4*n*(a*d - b*c)*(3*a*d - b*c))/(2*d^2)) + (3*b^5*g^4*n*x^2*(
a*d - b*c))/d + (b^3*g^4*n*(a*d - b*c)*(3*a^2*d^2 + b^2*c^2 - 3*a*b*c*d))/d
^3))/(3*b^3*g^4*(a*d - b*c)*(3*a^3*b^3*g^4 + 3*b^6*g^4*x^3 + 9*a^2*b^4*g^4*
x + 9*a*b^5*g^4*x^2))) - log(e*((a + b*x)/(c + d*x))^n)^2*((a*((B^2*c*d*i^2
)/(3*b^2) + (B^2*a*d^2*i^2)/(3*b^3)) + x*(b*((B^2*c*d*i^2)/(3*b^2) + (B^2*a
*d^2*i^2)/(3*b^3)) + (2*B^2*c*d*i^2)/(3*b) + (2*B^2*a*d^2*i^2)/(3*b^2)) + (
B^2*c^2*i^2)/(3*b) + (B^2*d^2*i^2*x^2)/b)/(a^3*g^4 + b^3*g^4*x^3 + 3*a*b^2*
g^4*x^2 + 3*a^2*b*g^4*x) - (B^2*d^3*i^2)/(3*b^3*g^4*(a*d - b*c))) - (B*d^3*
i^2*n*atan((((9*b^4*c*g^4 + 9*a*b^3*d*g^4)/(9*b^3*g^4) + 2*b*d*x)*1i)/(a*d
- b*c))*(3*A + B*n)*4i)/(9*b^3*g^4*(a*d - b*c))
```

3.176 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=319

$$\frac{2B^2di^2n^2(c+dx)^3}{27(bc-ad)^2g^5(a+bx)^3}-\frac{bB^2i^2n^2(c+dx)^4}{32(bc-ad)^2g^5(a+bx)^4}+\frac{2Bdi^2n(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9(bc-ad)^2g^5(a+bx)^3}-\frac{bBi^2n(c+ \ldots}{8(b \ldots}$$

```
[Out] 2/27*B^2*d*i^2*n^2*(d*x+c)^3/(-a*d+b*c)^2/g^5/(b*x+a)^3-1/32*b*B^2*i^2*n^2*
(d*x+c)^4/(-a*d+b*c)^2/g^5/(b*x+a)^4+2/9*B*d*i^2*n*(d*x+c)^3*(A+B*ln(e*((b*
x+a)/(d*x+c))^n))/(-a*d+b*c)^2/g^5/(b*x+a)^3-1/8*b*B*i^2*n*(d*x+c)^4*(A+B*l
n(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^2/g^5/(b*x+a)^4+1/3*d*i^2*(d*x+c)^3*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^2/g^5/(b*x+a)^3-1/4*b*i^2*(d*x+c
)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^2/g^5/(b*x+a)^4
```

Rubi [A]
time = 0.21, antiderivative size = 319, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.089$, Rules used = {2561, 2395, 2342, 2341}

$$-\frac{bi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^2}-\frac{bBi^2n(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^2}+\frac{di^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^5(a+bx)^3(bc-ad)^2}+\frac{2Bdi^2n(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^5(a+bx)^3(bc-ad)^2}-\frac{bB^2i^2n^2(c+dx)^4}{32g^5(a+bx)^4(bc-ad)^2}+\frac{2B^2di^2n^2(c+dx)^3}{27g^5(a+bx)^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^5,x]
```

```
[Out] (2*B^2*d*i^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*B^2*i
^2*n^2*(c + d*x)^4)/(32*(b*c - a*d)^2*g^5*(a + b*x)^4) + (2*B*d*i^2*n*(c +
d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^2*g^5*(a + b*
x)^3) - (b*B*i^2*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(8*(
b*c - a*d)^2*g^5*(a + b*x)^4) + (d*i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2)/(3*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*i^2*(c + d*x)^4*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*(b*c - a*d)^2*g^5*(a + b*x)^4)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(176c+176dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx = \int \left(\frac{30976(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^5(a+bx)^5} + \frac{61952d}{}\right.$$

$$= \frac{(30976d^2)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^3}dx}{b^2g^5} + \frac{(61952d(bc-ad))}{}$$

$$= -\frac{7744(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{61952d(bc}{}$$

$$= -\frac{7744(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{61952d(bc}{}$$

$$= -\frac{7744(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{61952d(bc}{}$$

$$= -\frac{7744(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{61952d(bc}{}$$

$$= -\frac{3872B(bc-ad)^2 n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^5(a+bx)^4} - \frac{77440Bd}{}$$

$$= -\frac{3872B(bc-ad)^2 n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^5(a+bx)^4} - \frac{77440Bd}{}$$

$$= -\frac{3872B(bc-ad)^2 n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^5(a+bx)^4} - \frac{77440Bd}{}$$

$$= -\frac{968B^2(bc-ad)^2n^2}{b^3g^5(a+bx)^4} - \frac{42592B^2d(bc-ad)n^2}{27b^3g^5(a+bx)^3} + \frac{9680B}{9b^3g^5(a}$$

$$= -\frac{968B^2(bc-ad)^2n^2}{b^3g^5(a+bx)^4} - \frac{42592B^2d(bc-ad)n^2}{27b^3g^5(a+bx)^3} + \frac{9680B}{9b^3g^5(a}$$

$$= -\frac{968B^2(bc-ad)^2n^2}{b^3g^5(a+bx)^4} - \frac{42592B^2d(bc-ad)n^2}{27b^3g^5(a+bx)^3} + \frac{9680B}{9b^3g^5(a}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 1.85, size = 1860, normalized size = 5.83

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^5,x]
```

```
[Out] -1/864*(i^2*(216*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 5
76*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 +
432*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
+ 216*B*d^2*n*(a + b*x)^2*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
) - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) +
 4*d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*
B*d*n*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c +
 d*x]) + B*n*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x
)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*n*(a + b*x)^2*
(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog
[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*Log[(d*(a +
b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])) + 32*B*d*n*(a + b*x)*(12*(b*c - a*d)^3*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]) - 36*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Lo
g[c + d*x] + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] -
 d*(a + b*x)*Log[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c)
 + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[
c + d*x]) + 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b
*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*
Log[c + d*x]) - 18*B*d^3*n*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[
(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) +
 18*B*d^3*n*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x
])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 3*B*n*(36*(b*
c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 48*d*(-(b*c) + a*d)^3*(
a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d)^2*(a +
 b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^3*(-(b*c) + a*d)*(a
+ b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 144*d^4*(a + b*x)^4*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^4*(a + b*x)^4*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 144*B*d^3*n*(a + b*x)^3*(b*
c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*n
*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x
)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*n*(a + b*x)*(2*(
b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2
+ 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*n*
(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a
+ b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b
```

```
*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*n*(a + b*x)^4*(Log[a + b*
x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)]) - 72*B*d^4*n*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b
*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])))/(b^3*(b*c - a*d)^2*g^5*(a + b*x)^4)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx+ag)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 8051 vs. 2(293) = 586.
time = 1.06, size = 8051, normalized size = 25.24

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x,
 algorithm="maxima")
```

```
[Out] -1/24*A*B*c^2*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*
d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2
*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3
*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*
b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5
*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^
6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b
*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*
d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4
*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) + 1/7
2*A*B*d^2*n*((13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^
3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*
a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*
a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2
*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*
d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2
*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^
2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d
```

+ 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)) + 1/36*A*B*c*d*n*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) + 1/6*(4*b*x + a)*B^2*c*d*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + 1/12*(6*b^2*x^2 + 4*a*b*x + a^2)*B^2*d^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/288*(12*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a))*log(d*x + c))*n^2/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 - 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6

```
*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)
*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4
*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2*c^2 + 1/432*(12*n*((7*a*b^3*c
^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4...
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1219 vs. $2(293) = 586$.
time = 0.45, size = 1219, normalized size = 3.82

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x,
 algorithm="fricas")
```

```
[Out] 1/864*(216*(A^2 + 2*A*B + B^2)*b^4*c^4 - 288*(A^2 + 2*A*B + B^2)*a*b^3*c^3*
d + 72*(A^2 + 2*A*B + B^2)*a^4*d^4 - 12*(7*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*
n^2 + 12*((A*B + B^2)*b^4*c*d^3 - (A*B + B^2)*a*b^3*d^4)*n)*x^3 + (27*B^2*b
^4*c^4 - 64*B^2*a*b^3*c^3*d + 37*B^2*a^4*d^4)*n^2 + 6*(72*(A^2 + 2*A*B + B^
2)*b^4*c^2*d^2 - 144*(A^2 + 2*A*B + B^2)*a*b^3*c*d^3 + 72*(A^2 + 2*A*B + B^
2)*a^2*b^2*d^4 - (5*B^2*b^4*c^2*d^2 + 32*B^2*a*b^3*c*d^3 - 37*B^2*a^2*b^2*d
^4)*n^2 + 12*((A*B + B^2)*b^4*c^2*d^2 - 8*(A*B + B^2)*a*b^3*c*d^3 + 7*(A*B
+ B^2)*a^2*b^2*d^4)*n)*x^2 - 72*(B^2*b^4*d^4*n^2*x^4 + 4*B^2*a*b^3*d^4*n^2*
x^3 - 6*(B^2*b^4*c^2*d^2 - 2*B^2*a*b^3*c*d^3)*n^2*x^2 - 4*(2*B^2*b^4*c^3*d
- 3*B^2*a*b^3*c^2*d^2)*n^2*x - (3*B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d)*n^2)*log
((b*x + a)/(d*x + c))^2 + 12*(9*(A*B + B^2)*b^4*c^4 - 16*(A*B + B^2)*a*b^3*
c^3*d + 7*(A*B + B^2)*a^4*d^4)*n + 4*(144*(A^2 + 2*A*B + B^2)*b^4*c^3*d - 2
16*(A^2 + 2*A*B + B^2)*a*b^3*c^2*d^2 + 72*(A^2 + 2*A*B + B^2)*a^3*b*d^4 + (
11*B^2*b^4*c^3*d - 48*B^2*a*b^3*c^2*d^2 + 37*B^2*a^3*b*d^4)*n^2 + 12*(5*(A*
B + B^2)*b^4*c^3*d - 12*(A*B + B^2)*a*b^3*c^2*d^2 + 7*(A*B + B^2)*a^3*b*d^4
)*n)*x - 12*((7*B^2*b^4*d^4*n^2 + 12*(A*B + B^2)*b^4*d^4*n)*x^4 + 4*(12*(A*
B + B^2)*a*b^3*d^4*n + (3*B^2*b^4*c*d^3 + 4*B^2*a*b^3*d^4)*n^2)*x^3 - (9*B^
2*b^4*c^4 - 16*B^2*a*b^3*c^3*d)*n^2 - 6*((B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d
^3)*n^2 + 12*((A*B + B^2)*b^4*c^2*d^2 - 2*(A*B + B^2)*a*b^3*c*d^3)*n)*x^2 -
 12*(3*(A*B + B^2)*b^4*c^4 - 4*(A*B + B^2)*a*b^3*c^3*d)*n - 4*((5*B^2*b^4*c
^3*d - 12*B^2*a*b^3*c^2*d^2)*n^2 + 12*(2*(A*B + B^2)*b^4*c^3*d - 3*(A*B + B
^2)*a*b^3*c^2*d^2)*n)*x)*log((b*x + a)/(d*x + c)))/((b^9*c^2 - 2*a*b^8*c*d
+ a^2*b^7*d^2)*g^5*x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^3*b^6*d^2)*g^5*x^
3 + 6*(a^2*b^7*c^2 - 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2 + 4*(a^3*b^6*c^2
- 2*a^4*b^5*c*d + a^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^5*b^4*c*d + a^6*b
^3*d^2)*g^5)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**5
,x)
```

```
[Out] Timed out
```

Giac [A]
time = 10.64, size = 461, normalized size = 1.45

$$\frac{1}{864}\left(\frac{72\left(3B^{2}bn^{2}-\frac{4(bx+a)B^{2}dn^{2}}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)^{2}}{\frac{(bx+a)^{4}bcg^{5}}{(dx+c)^{4}}-\frac{(bx+a)^{4}adg^{5}}{(dx+c)^{4}}}+\frac{12\left(9B^{2}bn^{2}-\frac{16(bx+a)B^{2}dn^{2}}{dx+c}+36ABbn+36B^{2}bn-\frac{48(bx+a)ABdn}{dx+c}-\frac{48(bx+a)B^{2}dn}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^{4}bcg^{5}}{(dx+c)^{4}}-\frac{(bx+a)^{4}adg^{5}}{(dx+c)^{4}}}+\frac{27B^{2}bn^{2}-\frac{64(bx+a)B^{2}dn^{2}}{dx+c}+108ABbn+108B^{2}bn-\frac{192(bx+a)ABdn}{dx+c}-\frac{192(bx+a)B^{2}dn}{dx+c}+216A^{2}b+432ABb+216B^{2}b-\frac{288(bx+a)A^{2}d}{dx+c}-\frac{576(bx+a)ABd}{dx+c}-\frac{288(bx+a)B^{2}d}{dx+c}}{\frac{(bx+a)^{4}bcg^{5}}{(dx+c)^{4}}-\frac{(bx+a)^{4}adg^{5}}{(dx+c)^{4}}}\right)\left(\frac{bc}{(bc-ad)^{2}}-\frac{ad}{(bc-ad)^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x,
 algorithm="giac")
```

```
[Out] 1/864*(72*(3*B^2*b*n^2 - 4*(b*x + a)*B^2*d*n^2/(d*x + c))*log((b*x + a)/(d*
x + c))^2/((b*x + a)^4*b*c*g^5/(d*x + c)^4 - (b*x + a)^4*a*d*g^5/(d*x + c)^
4) + 12*(9*B^2*b*n^2 - 16*(b*x + a)*B^2*d*n^2/(d*x + c) + 36*A*B*b*n + 36*B
^2*b*n - 48*(b*x + a)*A*B*d*n/(d*x + c) - 48*(b*x + a)*B^2*d*n/(d*x + c))*l
og((b*x + a)/(d*x + c))/((b*x + a)^4*b*c*g^5/(d*x + c)^4 - (b*x + a)^4*a*d*
g^5/(d*x + c)^4) + (27*B^2*b*n^2 - 64*(b*x + a)*B^2*d*n^2/(d*x + c) + 108*A
*B*b*n + 108*B^2*b*n - 192*(b*x + a)*A*B*d*n/(d*x + c) - 192*(b*x + a)*B^2*
d*n/(d*x + c) + 216*A^2*b + 432*A*B*b + 216*B^2*b - 288*(b*x + a)*A^2*d/(d*
x + c) - 576*(b*x + a)*A*B*d/(d*x + c) - 288*(b*x + a)*B^2*d/(d*x + c))/((b
*x + a)^4*b*c*g^5/(d*x + c)^4 - (b*x + a)^4*a*d*g^5/(d*x + c)^4))*(b*c/(b*c
 - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 9.42, size = 1934, normalized size = 6.06

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^5,x)
```

```
[Out] - log(e*((a + b*x)/(c + d*x))^n)*((a*(A*B*a*d^2*i^2 - (B^2*a*d^2*i^2*n)/2 +
 (B^2*b*c*d*i^2*n)/2 + 2*A*B*b*c*d*i^2) + x*(b*(A*B*a*d^2*i^2 - (B^2*a*d^2*
i^2*n)/2 + (B^2*b*c*d*i^2*n)/2 + 2*A*B*b*c*d*i^2) + 3*A*B*a*b*d^2*i^2 + 6*A
*B*b^2*c*d*i^2 - (3*B^2*a*b*d^2*i^2*n)/2 + (3*B^2*b^2*c*d*i^2*n)/2) + 3*A*B
*b^2*c^2*i^2 - B^2*a^2*d^2*i^2*n + (B^2*b^2*c^2*i^2*n)/2 + 6*A*B*b^2*d^2*i^
2*x^2 + (B^2*a*b*c*d*i^2*n)/2)/(6*a^4*b^3*g^5 + 6*b^7*g^5*x^4 + 24*a^3*b^4*
g^5*x + 24*a*b^6*g^5*x^3 + 36*a^2*b^5*g^5*x^2) + (B^2*d^4*i^2*(x^2*(b*(b*((
3*a*b^3*g^5*n*(a*d - b*c))/(2*d) + (b^3*g^5*n*(a*d - b*c)*(4*a*d - b*c))/(2
*d^2)) + (3*a*b^4*g^5*n*(a*d - b*c))/d + (b^4*g^5*n*(a*d - b*c)*(4*a*d - b*
```

```
c))/d^2) + (9*a*b^5*g^5*n*(a*d - b*c))/(2*d) + (3*b^5*g^5*n*(a*d - b*c)*(4*
a*d - b*c))/(2*d^2)) + a*(a*((3*a*b^3*g^5*n*(a*d - b*c))/(2*d) + (b^3*g^5*n
*(a*d - b*c)*(4*a*d - b*c))/(2*d^2)) + (b^3*g^5*n*(a*d - b*c)*(6*a^2*d^2 +
b^2*c^2 - 4*a*b*c*d))/(2*d^3)) + x*(a*(b*((3*a*b^3*g^5*n*(a*d - b*c))/(2*d)
 + (b^3*g^5*n*(a*d - b*c)*(4*a*d - b*c))/(2*d^2)) + (3*a*b^4*g^5*n*(a*d - b
*c))/d + (b^4*g^5*n*(a*d - b*c)*(4*a*d - b*c))/d^2) + b*(a*((3*a*b^3*g^5*n*
(a*d - b*c))/(2*d) + (b^3*g^5*n*(a*d - b*c)*(4*a*d - b*c))/(2*d^2)) + (b^3*
g^5*n*(a*d - b*c)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(2*d^3)) + (3*b^4*g^5*
n*(a*d - b*c)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(2*d^3)) + (3*b^3*g^5*n*(a
*d - b*c)*(4*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d^2))/(2*d^4) +
(6*b^6*g^5*n*x^3*(a*d - b*c))/d))/(6*b^3*g^5*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d
)*(6*a^4*b^3*g^5 + 6*b^7*g^5*x^4 + 24*a^3*b^4*g^5*x + 24*a*b^6*g^5*x^3 + 36
*a^2*b^5*g^5*x^2))) - ((72*A^2*a^3*d^3*i^2 - 216*A^2*b^3*c^3*i^2 + 37*B^2*a
^3*d^3*i^2*n^2 - 27*B^2*b^3*c^3*i^2*n^2 + 72*A^2*a*b^2*c^2*d*i^2 + 72*A^2*a
^2*b*c*d^2*i^2 + 84*A*B*a^3*d^3*i^2*n - 108*A*B*b^3*c^3*i^2*n + 37*B^2*a*b^
2*c^2*d*i^2*n^2 + 37*B^2*a^2*b*c*d^2*i^2*n^2 + 84*A*B*a*b^2*c^2*d*i^2*n + 8
4*A*B*a^2*b*c*d^2*i^2*n)/(12*(a*d - b*c)) + (x^3*(7*B^2*b^3*d^3*i^2*n^2 + 1
2*A*B*b^3*d^3*i^2*n))/(a*d - b*c) + (x*(72*A^2*a^2*b*d^3*i^2 - 144*A^2*b^3*
c^2*d*i^2 + 72*A^2*a*b^2*c*d^2*i^2 + 37*B^2*a^2*b*d^3*i^2*n^2 - 11*B^2*b^3*
c^2*d*i^2*n^2 - 60*A*B*b^3*c^2*d*i^2*n + 37*B^2*a*b^2*c*d^2*i^2*n^2 + 84*A*
B*a^2*b*d^3*i^2*n + 84*A*B*a*b^2*c*d^2*i^2*n))/(3*(a*d - b*c)) + (x^2*(72*A
^2*a*b^2*d^3*i^2 - 72*A^2*b^3*c*d^2*i^2 + 37*B^2*a*b^2*d^3*i^2*n^2 + 5*B^2*
b^3*c*d^2*i^2*n^2 - 12*A*B*b^3*c*d^2*i^2*n + 84*A*B*a*b^2*d^3*i^2*n))/(2*(a
*d - b*c)))/(72*a^4*b^3*g^5 + 72*b^7*g^5*x^4 + 288*a^3*b^4*g^5*x + 288*a*b^
6*g^5*x^3 + 432*a^2*b^5*g^5*x^2) - log(e*((a + b*x)/(c + d*x))^n)^2*((a*((B
^2*c*d*i^2)/(6*b^2) + (B^2*a*d^2*i^2)/(12*b^3)) + x*(b*((B^2*c*d*i^2)/(6*b^
2) + (B^2*a*d^2*i^2)/(12*b^3)) + (B^2*c*d*i^2)/(2*b) + (B^2*a*d^2*i^2)/(4*b
^2)) + (B^2*c^2*i^2)/(4*b) + (B^2*d^2*i^2*x^2)/(2*b))/(a^4*g^5 + b^4*g^5*x^
4 + 4*a*b^3*g^5*x^3 + 6*a^2*b^2*g^5*x^2 + 4*a^3*b*g^5*x) - (B^2*d^4*i^2)/(1
2*b^3*g^5*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - (B*d^4*i^2*n*atan(((2*b*d*x -
 (72*b^5*c^2*g^5 - 72*a^2*b^3*d^2*g^5)/(72*b^3*g^5*(a*d - b*c)))*1i)/(a*d -
 b*c))*(12*A + 7*B*n)*1i)/(36*b^3*g^5*(a*d - b*c)^2)
```

3.177 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=493

$$-\frac{2B^2d^2i^2n^2(c+dx)^3}{27(bc-ad)^3g^6(a+bx)^3}+\frac{bB^2di^2n^2(c+dx)^4}{16(bc-ad)^3g^6(a+bx)^4}-\frac{2b^2B^2i^2n^2(c+dx)^5}{125(bc-ad)^3g^6(a+bx)^5}-\frac{2Bd^2i^2n(c+dx)^3\left(A+B\right.}{9(bc-ad)^3g^6(a-}$$

```
[Out] -2/27*B^2*d^2*i^2*n^2*(d*x+c)^3/(-a*d+b*c)^3/g^6/(b*x+a)^3+1/16*b*B^2*d*i^2
*n^2*(d*x+c)^4/(-a*d+b*c)^3/g^6/(b*x+a)^4-2/125*b^2*B^2*i^2*n^2*(d*x+c)^5/(
-a*d+b*c)^3/g^6/(b*x+a)^5-2/9*B*d^2*i^2*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x
+c))^n))/(-a*d+b*c)^3/g^6/(b*x+a)^3+1/4*b*B*d*i^2*n*(d*x+c)^4*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^6/(b*x+a)^4-2/25*b^2*B*i^2*n*(d*x+c)^5*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^6/(b*x+a)^5-1/3*d^2*i^2*(d*x+c
)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^6/(b*x+a)^3+1/2*b*d*i^
2*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^6/(b*x+a)^4-1/
5*b^2*i^2*(d*x+c)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^6/(b*x
+a)^5
```

Rubi [A]
time = 0.30, antiderivative size = 493, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.089$, Rules used = {2561, 2395, 2342, 2341}

$$-\frac{b^2i^2(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{5g^6(a+bx)^5(bc-ad)^3}-\frac{2b^2Bi^2n(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{25g^6(a+bx)^5(bc-ad)^3}-\frac{d^2i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^6(a+bx)^3(bc-ad)^3}-\frac{2Bd^2i^2n(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^6(a+bx)^3(bc-ad)^3}+\frac{bdi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^6(a+bx)^4(bc-ad)^3}+\frac{bBdi^2n(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4g^6(a+bx)^4(bc-ad)^3}-\frac{2b^2B^2i^2n^2(c+dx)^5}{125g^6(a+bx)^5(bc-ad)^3}-\frac{2B^2d^2i^2n^2(c+dx)^3}{27g^6(a+bx)^3(bc-ad)^3}+\frac{bB^2di^2n^2(c+dx)^4}{16g^6(a+bx)^4(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^6,x]
```

```
[Out] (-2*B^2*d^2*i^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B^
2*d*i^2*n^2*(c + d*x)^4)/(16*(b*c - a*d)^3*g^6*(a + b*x)^4) - (2*b^2*B^2*i^
2*n^2*(c + d*x)^5)/(125*(b*c - a*d)^3*g^6*(a + b*x)^5) - (2*B*d^2*i^2*n*(c
+ d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^3*g^6*(a +
b*x)^3) + (b*B*d*i^2*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(4*(b*c - a*d)^3*g^6*(a + b*x)^4) - (2*b^2*B*i^2*n*(c + d*x)^5*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(25*(b*c - a*d)^3*g^6*(a + b*x)^5) - (d^2*i^2*(
c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^3*g^6*(
a + b*x)^3) + (b*d*i^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
)/(2*(b*c - a*d)^3*g^6*(a + b*x)^4) - (b^2*i^2*(c + d*x)^5*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2)/(5*(b*c - a*d)^3*g^6*(a + b*x)^5)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
```

```
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(177c+177dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^6}\,dx = \int \left(\frac{31329(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^6(a+bx)^6} + \frac{62658d(b\cdots}{}\right.$$

$$= \frac{(31329d^2)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^4}dx}{b^2g^6} + \frac{(62658d(bc-ad))\int\cdots}{}$$

$$= -\frac{31329(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{31329d(bc-\cdots}{}$$

$$= -\frac{31329(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{31329d(bc-\cdots}{}$$

$$= -\frac{31329(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{31329d(bc-\cdots}{}$$

$$= -\frac{31329(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{31329d(bc-\cdots}{}$$

$$= -\frac{62658B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{25b^3g^6(a+bx)^5} - \frac{93987Bd\cdots}{}$$

$$= -\frac{62658B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{25b^3g^6(a+bx)^5} - \frac{93987Bd\cdots}{}$$

$$= -\frac{62658B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{25b^3g^6(a+bx)^5} - \frac{93987Bd\cdots}{}$$

$$= -\frac{62658B^2(bc-ad)^2n^2}{125b^3g^6(a+bx)^5} - \frac{219303B^2d(bc-ad)n^2}{400b^3g^6(a+bx)^4} + \frac{149\cdots}{300b^3\cdots}$$

$$= -\frac{62658B^2(bc-ad)^2n^2}{125b^3g^6(a+bx)^5} - \frac{219303B^2d(bc-ad)n^2}{400b^3g^6(a+bx)^4} + \frac{149\cdots}{300b^3\cdots}$$

$$= -\frac{62658B^2(bc-ad)^2n^2}{125b^3g^6(a+bx)^5} - \frac{219303B^2d(bc-ad)n^2}{400b^3g^6(a+bx)^4} + \frac{149\cdots}{300b^3\cdots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 2.39, size = 2320, normalized size = 4.71

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^6,x]

[Out] -1/54000*(i^2*(10800*(b*c - a*d)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
 + 27000*d*(b*c - a*d)^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
 - 18000*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2 + 1000*B*d^2*n*(a + b*x)^2*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) - 36*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
d*x] + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a
+ b*x)*Log[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d
)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*
x]) + 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a
*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c
+ d*x]) - 18*B*d^3*n*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
+ d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*
d^3*n*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log
[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 375*B*d*n*(a + b*x)
*(36*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 48*d*(-(b*c) +
a*d)^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d
)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^3*(-(b*c) +
a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 144*d^4*(a + b*x)
^4*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^4*(a + b*x)^
4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 144*B*d^3*n*(a + b*
x)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36
*B*d^2*n*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*
(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*n*(a + b
*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a +
 b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x])
+ 3*B*n*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*
d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*L
og[a + b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*n*(a + b*x)^4*(Lo
g[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2,
 (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*n*(a + b*x)^4*((2*Log[(d*(a + b*
x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])) + 6*B*n*(-225*a*B*d*(b*c - a*d)^4*n + 144*B*(b*c - a*d)^5
*n - 225*b*B*d*(b*c - a*d)^4*n*x + 300*a*B*d^2*(b*c - a*d)^3*n*(a + b*x) -
180*B*d*(b*c - a*d)^4*n*(a + b*x) + 300*b*B*d^2*(b*c - a*d)^3*n*x*(a + b*x)
 - 450*a*B*d^3*(b*c - a*d)^2*n*(a + b*x)^2 + 640*B*d^2*(b*c - a*d)^3*n*(a +
 b*x)^2 - 450*b*B*d^3*(b*c - a*d)^2*n*x*(a + b*x)^2 + 900*a*B*d^4*(b*c - a*
d)*n*(a + b*x)^3 - 1860*B*d^3*(b*c - a*d)^2*n*(a + b*x)^3 + 900*b*B*d^4*(b*
```

```
c - a*d)*n*x*(a + b*x)^3 + 3600*b*B*c*d^4*n*(a + b*x)^4 - 3600*a*B*d^5*n*(a
 + b*x)^4 + 3720*B*d^4*(b*c - a*d)*n*(a + b*x)^4 + 900*a*B*d^5*n*(a + b*x)^
4*Log[a + b*x] + 900*b*B*d^5*n*x*(a + b*x)^4*Log[a + b*x] + 7320*B*d^5*n*(a
 + b*x)^5*Log[a + b*x] + 720*(b*c - a*d)^5*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) - 900*d*(b*c - a*d)^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]) + 1200*d^2*(b*c - a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]) - 1800*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]) + 3600*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]) + 3600*d^5*(a + b*x)^5*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]) - 900*a*B*d^5*n*(a + b*x)^4*Log[c + d*x] - 900*b*B*d^5*n*x*(a + b*x)^4*
Log[c + d*x] - 7320*B*d^5*n*(a + b*x)^5*Log[c + d*x] - 3600*d^5*(a + b*x)^5
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 1800*B*d^5*n*(a + b*
x)^5*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Po
lyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 1800*B*d^5*n*(a + b*x)^5*((2*Log[
(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)]))))/(b^3*(b*c - a*d)^3*g^6*(a + b*x)^5)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx+ag)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 10900 vs. $2(454) = 908$.
time = 1.43, size = 10900, normalized size = 22.11

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x,
 algorithm="maxima")
```

```
[Out] 1/150*A*B*c^2*n*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^
2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^
3 + 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3
*d - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*
a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 +
5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*
b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 -
```

4*a^5*b^5*c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6)) + 1/900*A*B*d^2*n*((47*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c^4 - 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6)) + 1/300*A*B*c*d*n*((27*a*b^4*c^4 - 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) + 1/10*(5*b*x + a)*B^2*c*d*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) + 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*B^2*d^2*log((b*x/(d*x + c) + a/

```
(d*x + c))^n*e)^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*
a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + 1/9000*(60*n*((60*b^4*d^
4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3
 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*
a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*
a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2
*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^
3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*
b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*d
^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6
*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^
6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6
*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*d^5
*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c
^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 1902 vs. $2(454) = 908$.
time = 0.45, size = 1902, normalized size = 3.86

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x,
 algorithm="fricas")
```

```
[Out] 1/54000*(10800*(A^2 + 2*A*B + B^2)*b^5*c^5 - 27000*(A^2 + 2*A*B + B^2)*a*b^
4*c^4*d + 18000*(A^2 + 2*A*B + B^2)*a^2*b^3*c^3*d^2 - 1800*(A^2 + 2*A*B + B
^2)*a^5*d^5 + 60*(47*(B^2*b^5*c*d^4 - B^2*a*b^4*d^5)*n^2 + 60*((A*B + B^2)*
b^5*c*d^4 - (A*B + B^2)*a*b^4*d^5)*n)*x^4 + 30*((13*B^2*b^5*c^2*d^3 + 350*B
^2*a*b^4*c*d^4 - 363*B^2*a^2*b^3*d^5)*n^2 - 60*((A*B + B^2)*b^5*c^2*d^3 - 1
0*(A*B + B^2)*a*b^4*c*d^4 + 9*(A*B + B^2)*a^2*b^3*d^5)*n)*x^3 + (864*B^2*b^
5*c^5 - 3375*B^2*a*b^4*c^4*d + 4000*B^2*a^2*b^3*c^3*d^2 - 1489*B^2*a^5*d^5)
*n^2 + 10*(1800*(A^2 + 2*A*B + B^2)*b^5*c^3*d^2 - 5400*(A^2 + 2*A*B + B^2)*
a*b^4*c^2*d^3 + 5400*(A^2 + 2*A*B + B^2)*a^2*b^3*c*d^4 - 1800*(A^2 + 2*A*B
+ B^2)*a^3*b^2*d^5 - (86*B^2*b^5*c^3*d^2 - 375*B^2*a*b^4*c^2*d^3 - 1200*B^2
*a^2*b^3*c*d^4 + 1489*B^2*a^3*b^2*d^5)*n^2 + 60*(2*(A*B + B^2)*b^5*c^3*d^2
- 15*(A*B + B^2)*a*b^4*c^2*d^3 + 60*(A*B + B^2)*a^2*b^3*c*d^4 - 47*(A*B + B
^2)*a^3*b^2*d^5)*n)*x^2 + 1800*(B^2*b^5*d^5*n^2*x^5 + 5*B^2*a*b^4*d^5*n^2*x
^4 + 10*B^2*a^2*b^3*d^5*n^2*x^3 + 10*(B^2*b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3
 + 3*B^2*a^2*b^3*c*d^4)*n^2*x^2 + 5*(3*B^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*d^2
+ 6*B^2*a^2*b^3*c^2*d^3)*n^2*x + (6*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 10*B
^2*a^2*b^3*c^3*d^2)*n^2)*log((b*x + a)/(d*x + c))^2 + 60*(72*(A*B + B^2)*b^
5*c^5 - 225*(A*B + B^2)*a*b^4*c^4*d + 200*(A*B + B^2)*a^2*b^3*c^3*d^2 - 47*
(A*B + B^2)*a^5*d^5)*n + 5*(5400*(A^2 + 2*A*B + B^2)*b^5*c^4*d - 14400*(A^2
```

```
 + 2*A*B + B^2)*a*b^4*c^3*d^2 + 10800*(A^2 + 2*A*B + B^2)*a^2*b^3*c^2*d^3 -
 1800*(A^2 + 2*A*B + B^2)*a^4*b*d^5 + (189*B^2*b^5*c^4*d - 1100*B^2*a*b^4*c
^3*d^2 + 2400*B^2*a^2*b^3*c^2*d^3 - 1489*B^2*a^4*b*d^5)*n^2 + 60*(27*(A*B +
 B^2)*b^5*c^4*d - 100*(A*B + B^2)*a*b^4*c^3*d^2 + 120*(A*B + B^2)*a^2*b^3*c
^2*d^3 - 47*(A*B + B^2)*a^4*b*d^5)*n)*x + 60*((47*B^2*b^5*d^5*n^2 + 60*(A*B
 + B^2)*b^5*d^5*n)*x^5 + 5*(60*(A*B + B^2)*a*b^4*d^5*n + (12*B^2*b^5*c*d^4
+ 35*B^2*a*b^4*d^5)*n^2)*x^4 + 10*(60*(A*B + B^2)*a^2*b^3*d^5*n - (3*B^2*b^
5*c^2*d^3 - 30*B^2*a*b^4*c*d^4 - 20*B^2*a^2*b^3*d^5)*n^2)*x^3 + (72*B^2*b^5
*c^5 - 225*B^2*a*b^4*c^4*d + 200*B^2*a^2*b^3*c^3*d^2)*n^2 + 10*((2*B^2*b^5*
c^3*d^2 - 15*B^2*a*b^4*c^2*d^3 + 60*B^2*a^2*b^3*c*d^4)*n^2 + 60*((A*B + B^2
)*b^5*c^3*d^2 - 3*(A*B + B^2)*a*b^4*c^2*d^3 + 3*(A*B + B^2)*a^2*b^3*c*d^4)*
n)*x^2 + 60*(6*(A*B + B^2)*b^5*c^5 - 15*(A*B + B^2)*a*b^4*c^4*d + 10*(A*B +
 B^2)*a^2*b^3*c^3*d^2)*n + 5*((27*B^2*b^5*c^4*d - 100*B^2*a*b^4*c^3*d^2 + 1
20*B^2*a^2*b^3*c^2*d^3)*n^2 + 60*(3*(A*B + B^2)*b^5*c^4*d - 8*(A*B + B^2)*a
*b^4*c^3*d^2 + 6*(A*B + B^2)*a^2*b^3*c^2*d^3)*n)*x)*log((b*x + a)/(d*x + c)
))/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5
*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 1
0*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 +
 10*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2
 + 5*(a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x
+ (a^5*b^6*c^3 - 3*a^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*g^6)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

$$\text{Timed out}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**6
,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 13.69, size = 811, normalized size = 1.65

$$\frac{1}{54000}\left(\frac{1800\left(6B^2b^2n^2-\frac{15(bx+a)B^2bdn^2}{dx+c}+\frac{10(bx+a)^2B^2d^2n^2}{(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)^2}{\frac{(bx+a)^5b^2c^2g^6}{(dx+c)^5}-\frac{2(bx+a)^5abcdg^6}{(dx+c)^5}+\frac{(bx+a)^5a^2d^2g^6}{(dx+c)^5}}+\frac{60\left(72B^2b^2n^2-\frac{225(bx+a)B^2bdn^2}{dx+c}+\frac{200(bx+a)^2B^2d^2n^2}{(dx+c)^2}+360ABb^2n+360B^2b^2n-\frac{900(bx+a)ABbdn}{dx+c}-\frac{900(bx+a)B^2bdn}{dx+c}+\frac{600(bx+a)^2ABd^2n}{(dx+c)^2}+\frac{600(bx+a)^2B^2d^2n}{(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^5b^2c^2g^6}{(dx+c)^5}-\frac{2(bx+a)^5abcdg^6}{(dx+c)^5}+\frac{(bx+a)^5a^2d^2g^6}{(dx+c)^5}}+\frac{864B^2b^2n^2-\frac{3375(bx+a)B^2bdn^2}{dx+c}+\frac{4000(bx+a)^2B^2d^2n^2}{(dx+c)^2}+4320ABb^2n+4320B^2b^2n-\frac{13500(bx+a)ABbdn}{dx+c}-\frac{13500(bx+a)B^2bdn}{dx+c}+\frac{12000(bx+a)^2ABd^2n}{(dx+c)^2}+\frac{12000(bx+a)^2B^2d^2n}{(dx+c)^2}+10800A^2b^2+21600ABb^2+10800B^2b^2-\frac{27000(bx+a)A^2bd}{dx+c}-\frac{54000(bx+a)ABbd}{dx+c}-\frac{27000(bx+a)B^2bd}{dx+c}+\frac{18000(bx+a)^2A^2d^2}{(dx+c)^2}+\frac{36000(bx+a)^2ABd^2}{(dx+c)^2}+\frac{18000(bx+a)^2B^2d^2}{(dx+c)^2}}{\frac{(bx+a)^5b^2c^2g^6}{(dx+c)^5}-\frac{2(bx+a)^5abcdg^6}{(dx+c)^5}+\frac{(bx+a)^5a^2d^2g^6}{(dx+c)^5}}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x,
 algorithm="giac")
```

```
[Out] 1/54000*(1800*(6*B^2*b^2*n^2 - 15*(b*x + a)*B^2*b*d*n^2/(d*x + c) + 10*(b*x
 + a)^2*B^2*d^2*n^2/(d*x + c)^2)*log((b*x + a)/(d*x + c))^2/((b*x + a)^5*b^
2*c^2*g^6/(d*x + c)^5 - 2*(b*x + a)^5*a*b*c*d*g^6/(d*x + c)^5 + (b*x + a)^5
*a^2*d^2*g^6/(d*x + c)^5) + 60*(72*B^2*b^2*n^2 - 225*(b*x + a)*B^2*b*d*n^2/
```

```
(d*x + c) + 200*(b*x + a)^2*B^2*d^2*n^2/(d*x + c)^2 + 360*A*B*b^2*n + 360*B
^2*b^2*n - 900*(b*x + a)*A*B*b*d*n/(d*x + c) - 900*(b*x + a)*B^2*b*d*n/(d*x
 + c) + 600*(b*x + a)^2*A*B*d^2*n/(d*x + c)^2 + 600*(b*x + a)^2*B^2*d^2*n/(
d*x + c)^2)*log((b*x + a)/(d*x + c))/((b*x + a)^5*b^2*c^2*g^6/(d*x + c)^5 -
 2*(b*x + a)^5*a*b*c*d*g^6/(d*x + c)^5 + (b*x + a)^5*a^2*d^2*g^6/(d*x + c)^
5) + (864*B^2*b^2*n^2 - 3375*(b*x + a)*B^2*b*d*n^2/(d*x + c) + 4000*(b*x +
a)^2*B^2*d^2*n^2/(d*x + c)^2 + 4320*A*B*b^2*n + 4320*B^2*b^2*n - 13500*(b*x
 + a)*A*B*b*d*n/(d*x + c) - 13500*(b*x + a)*B^2*b*d*n/(d*x + c) + 12000*(b*
x + a)^2*A*B*d^2*n/(d*x + c)^2 + 12000*(b*x + a)^2*B^2*d^2*n/(d*x + c)^2 +
10800*A^2*b^2 + 21600*A*B*b^2 + 10800*B^2*b^2 - 27000*(b*x + a)*A^2*b*d/(d*
x + c) - 54000*(b*x + a)*A*B*b*d/(d*x + c) - 27000*(b*x + a)*B^2*b*d/(d*x +
 c) + 18000*(b*x + a)^2*A^2*d^2/(d*x + c)^2 + 36000*(b*x + a)^2*A*B*d^2/(d*
x + c)^2 + 18000*(b*x + a)^2*B^2*d^2/(d*x + c)^2)/((b*x + a)^5*b^2*c^2*g^6/
(d*x + c)^5 - 2*(b*x + a)^5*a*b*c*d*g^6/(d*x + c)^5 + (b*x + a)^5*a^2*d^2*g
^6/(d*x + c)^5))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 11.15, size = 2500, normalized size = 5.07

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^6,x)
```

```
[Out] ((1800*A^2*a^4*d^4*i^2 + 10800*A^2*b^4*c^4*i^2 + 1489*B^2*a^4*d^4*i^2*n^2 +
 864*B^2*b^4*c^4*i^2*n^2 - 16200*A^2*a*b^3*c^3*d*i^2 + 1800*A^2*a^3*b*c*d^3
*i^2 + 2820*A*B*a^4*d^4*i^2*n + 4320*A*B*b^4*c^4*i^2*n + 1800*A^2*a^2*b^2*c
^2*d^2*i^2 + 1489*B^2*a^2*b^2*c^2*d^2*i^2*n^2 - 2511*B^2*a*b^3*c^3*d*i^2*n^
2 + 1489*B^2*a^3*b*c*d^3*i^2*n^2 + 2820*A*B*a^2*b^2*c^2*d^2*i^2*n - 9180*A*
B*a*b^3*c^3*d*i^2*n + 2820*A*B*a^3*b*c*d^3*i^2*n)/(60*(a*d - b*c)) + (x*(18
00*A^2*a^3*b*d^4*i^2 + 5400*A^2*b^4*c^3*d*i^2 - 9000*A^2*a*b^3*c^2*d^2*i^2
+ 1800*A^2*a^2*b^2*c*d^3*i^2 + 1489*B^2*a^3*b*d^4*i^2*n^2 + 189*B^2*b^4*c^3
*d*i^2*n^2 + 1620*A*B*b^4*c^3*d*i^2*n - 911*B^2*a*b^3*c^2*d^2*i^2*n^2 + 148
9*B^2*a^2*b^2*c*d^3*i^2*n^2 + 2820*A*B*a^3*b*d^4*i^2*n - 4380*A*B*a*b^3*c^2
*d^2*i^2*n + 2820*A*B*a^2*b^2*c*d^3*i^2*n))/(12*(a*d - b*c)) + (x^2*(1800*A
^2*a^2*b^2*d^4*i^2 + 1800*A^2*b^4*c^2*d^2*i^2 - 3600*A^2*a*b^3*c*d^3*i^2 +
1489*B^2*a^2*b^2*d^4*i^2*n^2 - 86*B^2*b^4*c^2*d^2*i^2*n^2 + 2820*A*B*a^2*b^
2*d^4*i^2*n + 120*A*B*b^4*c^2*d^2*i^2*n + 289*B^2*a*b^3*c*d^3*i^2*n^2 - 780
*A*B*a*b^3*c*d^3*i^2*n))/(6*(a*d - b*c)) + (x^3*(363*B^2*a*b^3*d^4*i^2*n^2
+ 13*B^2*b^4*c*d^3*i^2*n^2 - 60*A*B*b^4*c*d^3*i^2*n + 540*A*B*a*b^3*d^4*i^2
*n))/(2*(a*d - b*c)) + (d*x^4*(47*B^2*b^4*d^3*i^2*n^2 + 60*A*B*b^4*d^3*i^2*
n))/(a*d - b*c))/(x*(4500*a^4*b^5*c*g^6 - 4500*a^5*b^4*d*g^6) - x^4*(4500*a
^2*b^7*d*g^6 - 4500*a*b^8*c*g^6) + x^5*(900*b^9*c*g^6 - 900*a*b^8*d*g^6) +
x^2*(9000*a^3*b^6*c*g^6 - 9000*a^4*b^5*d*g^6) + x^3*(9000*a^2*b^7*c*g^6 - 9
```

000*a^3*b^6*d*g^6) + 900*a^5*b^4*c*g^6 - 900*a^6*b^3*d*g^6) - log(e*((a + b
*x)/(c + d*x))^n)^2*((a*((B^2*c*d*i^2)/(10*b^2) + (B^2*a*d^2*i^2)/(30*b^3))
 + x*(b*((B^2*c*d*i^2)/(10*b^2) + (B^2*a*d^2*i^2)/(30*b^3)) + (2*B^2*c*d*i^
2)/(5*b) + (2*B^2*a*d^2*i^2)/(15*b^2)) + (B^2*c^2*i^2)/(5*b) + (B^2*d^2*i^2
*x^2)/(3*b))/(a^5*g^6 + b^5*g^6*x^5 + 5*a*b^4*g^6*x^4 + 10*a^3*b^2*g^6*x^2
+ 10*a^2*b^3*g^6*x^3 + 5*a^4*b*g^6*x) - (B^2*d^5*i^2)/(30*b^3*g^6*(a^3*d^3
- b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) - log(e*((a + b*x)/(c + d*x))^
n)*((a*(A*B*a*d^2*i^2 - (B^2*a*d^2*i^2*n)/2 + (B^2*b*c*d*i^2*n)/2 + 3*A*B*b
*c*d*i^2) + x*(b*(A*B*a*d^2*i^2 - (B^2*a*d^2*i^2*n)/2 + (B^2*b*c*d*i^2*n)/2
 + 3*A*B*b*c*d*i^2) + 4*A*B*a*b*d^2*i^2 + 12*A*B*b^2*c*d*i^2 - 2*B^2*a*b*d^
2*i^2*n + 2*B^2*b^2*c*d*i^2*n) + 6*A*B*b^2*c^2*i^2 - B^2*a^2*d^2*i^2*n + B^
2*b^2*c^2*i^2*n + 10*A*B*b^2*d^2*i^2*x^2)/(15*a^5*b^3*g^6 + 15*b^8*g^6*x^5
+ 75*a^4*b^4*g^6*x + 75*a*b^7*g^6*x^4 + 150*a^3*b^5*g^6*x^2 + 150*a^2*b^6*g
^6*x^3) + (B^2*d^5*i^2*(x^3*(b*(b*(b*((3*a*b^3*g^6*n*(a*d - b*c))/d + (3*b^
3*g^6*n*(a*d - b*c)*(5*a*d - b*c))/(4*d^2)) + (6*a*b^4*g^6*n*(a*d - b*c))/d
 + (3*b^4*g^6*n*(a*d - b*c)*(5*a*d - b*c))/(2*d^2)) + (9*a*b^5*g^6*n*(a*d -
 b*c))/d + (9*b^5*g^6*n*(a*d - b*c)*(5*a*d - b*c))/(4*d^2)) + (12*a*b^6*g^6
n(a*d - b*c))/d + (3*b^6*g^6*n*(a*d - b*c)*(5*a*d - b*c))/d^2) + x*(a*(a*
(b*((3*a*b^3*g^6*n*(a*d - b*c))/d + (3*b^3*g^6*n*(a*d - b*c)*(5*a*d - b*c))
/(4*d^2)) + (6*a*b^4*g^6*n*(a*d - b*c))/d + (3*b^4*g^6*n*(a*d - b*c)*(5*a*d
 - b*c))/(2*d^2)) + b*(a*((3*a*b^3*g^6*n*(a*d - b*c))/d + (3*b^3*g^6*n*(a*d
 - b*c)*(5*a*d - b*c))/(4*d^2)) + (b^3*g^6*n*(a*d - b*c)*(10*a^2*d^2 + b^2*
c^2 - 5*a*b*c*d))/(2*d^3)) + (3*b^4*g^6*n*(a*d - b*c)*(10*a^2*d^2 + b^2*c^2
 - 5*a*b*c*d))/(2*d^3)) + b*(a*(a*((3*a*b^3*g^6*n*(a*d - b*c))/d + (3*b^3*g
^6*n*(a*d - b*c)*(5*a*d - b*c))/(4*d^2)) + (b^3*g^6*n*(a*d - b*c)*(10*a^2*d
^2 + b^2*c^2 - 5*a*b*c*d))/(2*d^3)) + (3*b^3*g^6*n*(a*d - b*c)*(10*a^3*d^3
- b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2))/(4*d^4)) + (3*b^4*g^6*n*(a*d -
 b*c)*(10*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2))/d^4) + x^2*(
a*(b*(b*((3*a*b^3*g^6*n*(a*d - b*c))/d + (3*b^3*g^6*n*(a*d - b*c)*(5*a*d -
b*c))/(4*d^2)) + (6*a*b^4*g^6*n*(a*d - b*c))/d + (3*b^4*g^6*n*(a*d - b*c)*(
5*a*d - b*c))/(2*d^2)) + (9*a*b^5*g^6*n*(a*d - b*c))/d + (9*b^5*g^6*n*(a*d
- b*c)*(5*a*d - b*c))/(4*d^2)) + b*(a*(b*((3*a*b^3*g^6*n*(a*d - b*c))/d + (
3*b^3*g^6*n*(a*d - b*c)*(5*a*d - b*c))/(4*d^2)) + (6*a*b^4*g^6*n*(a*d - b*c
))/d + (3*b^4*g^6*n*(a*d - b*c)*(5*a*d - b*c))/(2*d^2)) + b*(a*((3*a*b^3*g^
6*n*(a*d - b*c))/d + (3*b^3*g^6*n*(a*d - b*c)*(5*a*d - b*c))/(4*d^2)) + (b^
3*g^6*n*(a*d - b*c)*(10*a^2*d^2 + b^2*c^2 - 5*a*b*c*d))/(2*d^3)) + (3*b^4*g
^6*n*(a*d - b*c)*(10*a^2*d^2 + b^2*c^2 - 5*a*b*c*d))/(2*d^3)) + (3*b^5*g^6*
n*(a*d - b*c)*(10*a^2*d^2 + b^2*c^2 - 5*a*b*c*d))/d^3) + a*(a*(a*((3*a*b^3*
g^6*n*(a*d - b*c))/d + (3*b^3*g^6*n*(a*d - b*c)*(5*a*d - b*c))/(4*d^2)) + (
b^3*g^6*n*(a*d - b*c)*(10*a^2*d^2 + b^2*c^2 - 5*a*b*c*d))/(2*d^3)) + (3*b^3
*g^6*n*(a*d - b*c)*(10*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2))
/(4*d^4)) + (15*b^7*g^6*n*x^4*(a*d - b*c))/d + (3*b^3*g^6*n*(a*d - b*c)*(5*
a^4*d^4 + b^4*c^4 + 10*a^2*b^2*c^2*d^2 - 5*a*b^3*c^3*d - 10*a^3*b*c*d^3))/d
^5))/(15*b^3*g^6*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)*(15*a^
5*b^3*g^6 + 15*b^8*g^6*x^5 + 75*a^4*b^4*g^6*x + 75*a*b^7*g^6*x^4 + 150*a^3*

```
b^5*g^6*x^2 + 150*a^2*b^6*g^6*x^3))) - (B*d^5*i^2*n*atan((B*d^5*i^2*n*(60*A
 + 47*B*n)*((b^6*c^3*g^6 + a^3*b^3*d^3*g^6 - a*...
```

3.178 $\int (ag+bgx)^3(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=1172

$$\frac{5B^2(bc-ad)^6g^3i^3n^2x}{84b^3d^3}+\frac{B^2(bc-ad)^3g^3i^3n^2(a+bx)^4}{140b^4}-\frac{29B^2(bc-ad)^5g^3i^3n^2(c+dx)^2}{840b^2d^4}+\frac{47B^2(bc-ad)^4g^3i^3}{1260bd}$$

```
[Out] 5/84*B^2*(-a*d+b*c)^6*g^3*i^3*n^2*x/b^3/d^3+1/140*B^2*(-a*d+b*c)^3*g^3*i^3*
n^2*(b*x+a)^4/b^4-29/840*B^2*(-a*d+b*c)^5*g^3*i^3*n^2*(d*x+c)^2/b^2/d^4+47/
1260*B^2*(-a*d+b*c)^4*g^3*i^3*n^2*(d*x+c)^3/b/d^4-13/420*B^2*(-a*d+b*c)^3*g
^3*i^3*n^2*(d*x+c)^4/d^4+1/105*b*B^2*(-a*d+b*c)^2*g^3*i^3*n^2*(d*x+c)^5/d^4
-1/210*B*(-a*d+b*c)^4*g^3*i^3*n*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b
^4/d-3/140*B*(-a*d+b*c)^3*g^3*i^3*n*(b*x+a)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n
))/b^4-1/35*B*(-a*d+b*c)^2*g^3*i^3*n*(b*x+a)^4*(d*x+c)*(A+B*ln(e*((b*x+a)/(
d*x+c))^n))/b^3+2/21*B*(-a*d+b*c)^4*g^3*i^3*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/
(d*x+c))^n))/b/d^4-3/14*B*(-a*d+b*c)^3*g^3*i^3*n*(d*x+c)^4*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))/d^4+6/35*b*B*(-a*d+b*c)^2*g^3*i^3*n*(d*x+c)^5*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))/d^4-1/21*b^2*B*(-a*d+b*c)*g^3*i^3*n*(d*x+c)^6*(A+B*ln(e*
((b*x+a)/(d*x+c))^n))/d^4+1/140*(-a*d+b*c)^3*g^3*i^3*(b*x+a)^4*(A+B*ln(e*((
b*x+a)/(d*x+c))^n))^2/b^4+1/35*(-a*d+b*c)^2*g^3*i^3*(b*x+a)^4*(d*x+c)*(A+B*
ln(e*((b*x+a)/(d*x+c))^n))^2/b^3+1/14*(-a*d+b*c)*g^3*i^3*(b*x+a)^4*(d*x+c)^
2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^2+1/7*g^3*i^3*(b*x+a)^4*(d*x+c)^3*(A+
B*ln(e*((b*x+a)/(d*x+c))^n))^2/b+1/420*B*(-a*d+b*c)^5*g^3*i^3*n*(b*x+a)^2*(
3*A+B*n+3*B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/d^2-1/420*B*(-a*d+b*c)^6*g^3*i^3
*n*(b*x+a)*(6*A+5*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/d^3-1/420*B*(-a*d+
b*c)^7*g^3*i^3*n*(6*A+11*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b
/(d*x+c))/b^4/d^4-1/210*B^2*(-a*d+b*c)^7*g^3*i^3*n^2*ln((b*x+a)/(d*x+c))/b^
4/d^4-11/420*B^2*(-a*d+b*c)^7*g^3*i^3*n^2*ln(d*x+c)/b^4/d^4-1/70*B^2*(-a*d+
b*c)^7*g^3*i^3*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/d^4
```

Rubi [A]
time = 1.05, antiderivative size = 1172, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 14, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.311$, Rules used = {2561, 2383, 2381, 2384, 2354, 2438, 2373, 45, 47, 37, 2382, 12, 79, 1634}

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2,x]
```

```
[Out] (5*B^2*(b*c - a*d)^6*g^3*i^3*n^2*x)/(84*b^3*d^3) + (B^2*(b*c - a*d)^3*g^3*i
^3*n^2*(a + b*x)^4)/(140*b^4) - (29*B^2*(b*c - a*d)^5*g^3*i^3*n^2*(c + d*x)
^2)/(840*b^2*d^4) + (47*B^2*(b*c - a*d)^4*g^3*i^3*n^2*(c + d*x)^3)/(1260*b*
```

```
d^4) - (13*B^2*(b*c - a*d)^3*g^3*i^3*n^2*(c + d*x)^4)/(420*d^4) + (b*B^2*(b
*c - a*d)^2*g^3*i^3*n^2*(c + d*x)^5)/(105*d^4) - (B*(b*c - a*d)^4*g^3*i^3*n
*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(210*b^4*d) - (3*B*(b*
c - a*d)^3*g^3*i^3*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(1
40*b^4) - (B*(b*c - a*d)^2*g^3*i^3*n*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(35*b^3) + (2*B*(b*c - a*d)^4*g^3*i^3*n*(c + d*x)^3
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(21*b*d^4) - (3*B*(b*c - a*d)^3*g^
3*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(14*d^4) + (6*b
*B*(b*c - a*d)^2*g^3*i^3*n*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]))/(35*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*n*(c + d*x)^6*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]))/(21*d^4) + ((b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2)/(140*b^4) + ((b*c - a*d)^2*g^3*i^3*(a + b
*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(35*b^3) + ((b*c
- a*d)*g^3*i^3*(a + b*x)^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2)/(14*b^2) + (g^3*i^3*(a + b*x)^4*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])^2)/(7*b) + (B*(b*c - a*d)^5*g^3*i^3*n*(a + b*x)^2*(3*A + B*n
+ 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(420*b^4*d^2) - (B*(b*c - a*d)^6*g^3
*i^3*n*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n]))/(420*b
^4*d^3) - (B*(b*c - a*d)^7*g^3*i^3*n*(6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(
c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(420*b^4*d^4) - (B^2*(b*c - a
*d)^7*g^3*i^3*n^2*Log[(a + b*x)/(c + d*x)])/(210*b^4*d^4) - (11*B^2*(b*c -
a*d)^7*g^3*i^3*n^2*Log[c + d*x])/(420*b^4*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3
*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(70*b^4*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*(S
```

```
implify[m + n + 2]/((b*c - a*d)*(m + 1))), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (178c+178dx)^3(ag+bgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(\frac{(-bc+ad)^3g^3(178c+178dx)^3 \left(A\right.}{d^3}\right.$$

$$= \frac{(b^3g^3)\int(178c+178dx)^6 \left(A+B\log\left(e\right.\right.}{5639752d^3}$$

$$= -\frac{1409938(bc-ad)^3g^3(c+dx)^4 \left(A+\right.}{d^4}$$

$$= -\frac{1409938(bc-ad)^3g^3(c+dx)^4 \left(A+\right.}{d^4}$$

$$= -\frac{1409938(bc-ad)^3g^3(c+dx)^4 \left(A+\right.}{d^4}$$

$$= -\frac{1409938(bc-ad)^3g^3(c+dx)^4 \left(A+\right.}{d^4}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{1409938}{}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876}{}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876}{}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876}{}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876}{}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 2448 vs. $2(1172) = 2344$.
time = 2.20, size = 2448, normalized size = 2.09

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2,x]

[Out] (g^3*i^3*(35*(b*c - a*d)^3*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2 + 84*d*(b*c - a*d)^2*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2 + 70*d^2*(b*c - a*d)*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2 + 20*d^3*(a + b*x)^7*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (35*B*(b
*c - a*d)^4*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[
e*((a + b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d
)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n
*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a
+ b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])))/(3*d^4) + (7*B*(b*c - a*d)^3*n*(24*A*b*d*(b*c - a*d)
^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 12*d
^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*d^3
*(b*c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*d^4*(a
+ b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[
c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
d*x] + 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c
- a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(
b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x])
 + 12*B*(b*c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c -
 a*d)^4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4 - (7*B*(b*c - a*d)^2*n*(
120*A*b*d*(b*c - a*d)^4*x + 120*B*d*(b*c - a*d)^4*(a + b*x)*Log[e*((a + b*x
)/(c + d*x))^n] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 24*d^5*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
) - 120*B*(b*c - a*d)^5*n*Log[c + d*x] - 120*(b*c - a*d)^5*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])*Log[c + d*x] + 20*B*(b*c - a*d)^3*n*(2*b*d*(b*c - a*
d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 5*B*(b*c - a*d)^2*
n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*
x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 2*B*(b*c - a*d)*n*(12*b*d*(b*c - a*d
)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b*x)^3 - 3
*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) + 60*B*(b*c - a*d)^4*n*(b
*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 60*B*(b*c - a*d)^5*n*((2*Log[(d*(a +
b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])))/(6*d^4) + (B*(b*c - a*d)*n*(360*A*b*d*(b*c - a*d)^5*x
+ 60*b^2*B*c*d*(b*c - a*d)^4*n*x - 60*a*b*B*d^2*(b*c - a*d)^4*n*x + 462*b*B
*d*(b*c - a*d)^5*n*x - 30*b*B*c*d^2*(b*c - a*d)^3*n*(a + b*x)^2 + 30*a*B*d^
3*(b*c - a*d)^3*n*(a + b*x)^2 - 141*B*d^2*(b*c - a*d)^4*n*(a + b*x)^2 + 20*
```

```
b*B*c*d^3*(b*c - a*d)^2*n*(a + b*x)^3 - 20*a*B*d^4*(b*c - a*d)^2*n*(a + b*x
)^3 + 54*B*d^3*(b*c - a*d)^3*n*(a + b*x)^3 - 15*b*B*c*d^4*(b*c - a*d)*n*(a
+ b*x)^4 + 15*a*B*d^5*(b*c - a*d)*n*(a + b*x)^4 - 18*B*d^4*(b*c - a*d)^2*n*
(a + b*x)^4 + 12*b*B*c*d^5*n*(a + b*x)^5 - 12*a*B*d^6*n*(a + b*x)^5 + 360*B
*d*(b*c - a*d)^5*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 180*d^2*(b*c -
a*d)^4*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 120*d^3*(b*c -
a*d)^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 90*d^4*(b*c - a
*d)^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^5*(b*c - a*
d)*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 60*d^6*(a + b*x)^6*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 60*b*B*c*(b*c - a*d)^5*n*Log[c + d
*x] + 60*a*B*d*(b*c - a*d)^5*n*Log[c + d*x] - 822*B*(b*c - a*d)^6*n*Log[c +
 d*x] - 360*(b*c - a*d)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*
x] + 180*B*(b*c - a*d)^6*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c +
d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(9*d^4)))/(
140*b^4)
```

Maple [F]
time = 0.37, size = 0, normalized size = 0.00

$$\int (bgx + ag)^3 (dix + ci)^3 \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 6587 vs. 2(1070) = 2140.
time = 1.02, size = 6587, normalized size = 5.62

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="maxima")
```

```
[Out] -2/7*I*A*B*b^3*d^3*g^3*x^7*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/7*I*A
^2*b^3*d^3*g^3*x^7 - I*A*B*b^3*c*d^2*g^3*x^6*log((b*x/(d*x + c) + a/(d*x +
c))^n*e) - I*A*B*a*b^2*d^3*g^3*x^6*log((b*x/(d*x + c) + a/(d*x + c))^n*e) -
 1/2*I*A^2*b^3*c*d^2*g^3*x^6 - 1/2*I*A^2*a*b^2*d^3*g^3*x^6 - 6/5*I*A*B*b^3*
c^2*d*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 18/5*I*A*B*a*b^2*c*d
^2*g^3*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 6/5*I*A*B*a^2*b*d^3*g^3
*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/5*I*A^2*b^3*c^2*d*g^3*x^5 -
 9/5*I*A^2*a*b^2*c*d^2*g^3*x^5 - 3/5*I*A^2*a^2*b*d^3*g^3*x^5 - 1/2*I*A*B*b^
3*c^3*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 9/2*I*A*B*a*b^2*c^2*
```

```
d*g^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 9/2*I*A*B*a^2*b*c*d^2*g^
3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/2*I*A*B*a^3*d^3*g^3*x^4*lo
g((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*I*A^2*b^3*c^3*g^3*x^4 - 9/4*I*A^
2*a*b^2*c^2*d*g^3*x^4 - 9/4*I*A^2*a^2*b*c*d^2*g^3*x^4 - 1/4*I*A^2*a^3*d^3*g
^3*x^4 - 2*I*A*B*a*b^2*c^3*g^3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) -
 6*I*A*B*a^2*b*c^2*d*g^3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2*I*A
*B*a^3*c*d^2*g^3*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A^2*a*b^2*c
^3*g^3*x^3 - 3*I*A^2*a^2*b*c^2*d*g^3*x^3 - I*A^2*a^3*c*d^2*g^3*x^3 - 3*I*A*
B*a^2*b*c^3*g^3*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3*I*A*B*a^3*c^
2*d*g^3*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/2*I*A^2*a^2*b*c^3*g^
3*x^2 - 3/2*I*A^2*a^3*c^2*d*g^3*x^2 - 1/210*I*A*B*b^3*d^3*g^3*n*(60*a^7*log
(b*x + a)/b^7 - 60*c^7*log(d*x + c)/d^7 - (10*(b^6*c*d^5 - a*b^5*d^6)*x^6 -
 12*(b^6*c^2*d^4 - a^2*b^4*d^6)*x^5 + 15*(b^6*c^3*d^3 - a^3*b^3*d^6)*x^4 -
20*(b^6*c^4*d^2 - a^4*b^2*d^6)*x^3 + 30*(b^6*c^5*d - a^5*b*d^6)*x^2 - 60*(b
^6*c^6 - a^6*d^6)*x)/(b^6*d^6)) + 1/60*I*A*B*b^3*c*d^2*g^3*n*(60*a^6*log(b*
x + a)/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15
*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*
(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) + 1/60*I
*A*B*a*b^2*d^3*g^3*n*(60*a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6 + (
12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b
^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^
5 - a^5*d^5)*x)/(b^5*d^5)) - 1/10*I*A*B*b^3*c^2*d*g^3*n*(12*a^5*log(b*x + a
)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c
^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a
^4*d^4)*x)/(b^4*d^4)) - 3/10*I*A*B*a*b^2*c*d^2*g^3*n*(12*a^5*log(b*x + a)/b
^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*
d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*
d^4)*x)/(b^4*d^4)) - 1/10*I*A*B*a^2*b*d^3*g^3*n*(12*a^5*log(b*x + a)/b^5 -
12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 -
 a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*
x)/(b^4*d^4)) + 1/12*I*A*B*b^3*c^3*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*lo
g(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 3/4*I*A*B*a*b^2*c^2*d*g^3*n*(6
*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)
*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))
+ 3/4*I*A*B*a^2*b*c*d^2*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/
d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b
^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/12*I*A*B*a^3*d^3*g^3*n*(6*a^4*log(b*x +
 a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*
c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - I*A*B*a*b^2*
c^3*g^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*
b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3*I*A*B*a^2*b*c^2*d*g^3*
n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x
^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - I*A*B*a^3*c*d^2*g^3*n*(2*a^3*log
(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*
```

```
c^2 - a^2*d^2)*x)/(b^2*d^2)) + 3*I*A*B*a^2*b*c^3*g^3*n*(a^2*log(b*x + a)/b^
2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 3*I*A*B*a^3*c^2*d*g^3*n*(
a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 2*I*A*
B*a^3*c^3*g^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) - 2*I*A*B*a^3*c^3*g^3
*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A^2*a^3*c^3*g^3*x + 1/420*(10
7*I*a^4*b^2*c^3*d^4*g^3*n^2 - 39*I*a^5*b*c^2*d^5*g^3*n^2 + 6*I*a^6*c*d^6*g^
3*n^2 - 6*(I*n^2 - 7*I*n)*a*b^5*c^6*d*g^3 - 3*(-13*I*n^2 + 42*I*n)*a^2*b^4*
c^5*d^2*g^3 + (-107*I*n^2 + 210*I*n)*a^3*b^3*c^4*d^3*g^3 - 6*I*b^6*c^7*g^3*
n)*B^2*log(d*x + c)/(b^3*d^4) + 1/70*(-I*b^7*c^7*g^3*n^2 + 7*I*a*b^6*c^6*d*
g^3*n^2 - 21*I*a^2*b^5*c^5*d^2*g^3*n^2 + 35*I*a^3*b^4*c^4*d^3*g^3*n^2 - 35*
I*a^4*b^3*c^3*d^4*g^3*n^2 + 21*I*a^5*b^2*c^2*d^5*g^3*n^2 - 7*I*a^6*b*c*d^6*
g^3*n^2 + I*a^7*d^7*g^3*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) +
1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^...
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="fricas")
```

```
[Out] 1/140*(-20*I*B^2*b^3*d^3*g^3*n^2*x^7 - 140*I*B^2*a^3*c^3*g^3*n^2*x - 70*(I*
B^2*b^3*c*d^2 + I*B^2*a*b^2*d^3)*g^3*n^2*x^6 - 84*(I*B^2*b^3*c^2*d + 3*I*B^
2*a*b^2*c*d^2 + I*B^2*a^2*b*d^3)*g^3*n^2*x^5 - 35*(I*B^2*b^3*c^3 + 9*I*B^2*
a*b^2*c^2*d + 9*I*B^2*a^2*b*c*d^2 + I*B^2*a^3*d^3)*g^3*n^2*x^4 - 140*(I*B^2
*a*b^2*c^3 + 3*I*B^2*a^2*b*c^2*d + I*B^2*a^3*c*d^2)*g^3*n^2*x^3 - 210*(I*B^
2*a^2*b*c^3 + I*B^2*a^3*c^2*d)*g^3*n^2*x^2)*log((b*x + a)/(d*x + c))^2 + in
tegral(-1/70*(70*(I*A^2 + 2*I*A*B + I*B^2)*b^4*d^4*g^3*x^8 + 70*(I*A^2 + 2*
I*A*B + I*B^2)*a^4*c^4*g^3 + 280*((I*A^2 + 2*I*A*B + I*B^2)*b^4*c*d^3 + (I*
A^2 + 2*I*A*B + I*B^2)*a*b^3*d^4)*g^3*x^7 + 140*(3*(I*A^2 + 2*I*A*B + I*B^2
)*b^4*c^2*d^2 + 8*(I*A^2 + 2*I*A*B + I*B^2)*a*b^3*c*d^3 + 3*(I*A^2 + 2*I*A*
B + I*B^2)*a^2*b^2*d^4)*g^3*x^6 + 280*((I*A^2 + 2*I*A*B + I*B^2)*b^4*c^3*d
+ 6*(I*A^2 + 2*I*A*B + I*B^2)*a*b^3*c^2*d^2 + 6*(I*A^2 + 2*I*A*B + I*B^2)*a
^2*b^2*c*d^3 + (I*A^2 + 2*I*A*B + I*B^2)*a^3*b*d^4)*g^3*x^5 + 70*((I*A^2 +
2*I*A*B + I*B^2)*b^4*c^4 + 16*(I*A^2 + 2*I*A*B + I*B^2)*a*b^3*c^3*d + 36*(I
*A^2 + 2*I*A*B + I*B^2)*a^2*b^2*c^2*d^2 + 16*(I*A^2 + 2*I*A*B + I*B^2)*a^3*
b*c*d^3 + (I*A^2 + 2*I*A*B + I*B^2)*a^4*d^4)*g^3*x^4 + 280*((I*A^2 + 2*I*A*
B + I*B^2)*a*b^3*c^4 + 6*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b^2*c^3*d + 6*(I*A^2
 + 2*I*A*B + I*B^2)*a^3*b*c^2*d^2 + (I*A^2 + 2*I*A*B + I*B^2)*a^4*c*d^3)*g^
3*x^3 + 140*(3*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b^2*c^4 + 8*(I*A^2 + 2*I*A*B +
 I*B^2)*a^3*b*c^3*d + 3*(I*A^2 + 2*I*A*B + I*B^2)*a^4*c^2*d^2)*g^3*x^2 + 28
0*((I*A^2 + 2*I*A*B + I*B^2)*a^3*b*c^4 + (I*A^2 + 2*I*A*B + I*B^2)*a^4*c^3*
d)*g^3*x + (140*(I*A*B + I*B^2)*b^4*d^4*g^3*n*x^8 + 140*(I*A*B + I*B^2)*a^4
```

```
*c^4*g^3*n + 20*((-I*B^2*b^4*c*d^3 + I*B^2*a*b^3*d^4)*g^3*n^2 + 28*((I*A*B
+ I*B^2)*b^4*c*d^3 + (I*A*B + I*B^2)*a*b^3*d^4)*g^3*n)*x^7 + 70*((-I*B^2*b^
4*c^2*d^2 + I*B^2*a^2*b^2*d^4)*g^3*n^2 + 4*(3*(I*A*B + I*B^2)*b^4*c^2*d^2 +
 8*(I*A*B + I*B^2)*a*b^3*c*d^3 + 3*(I*A*B + I*B^2)*a^2*b^2*d^4)*g^3*n)*x^6
+ 28*(3*(-I*B^2*b^4*c^3*d - 2*I*B^2*a*b^3*c^2*d^2 + 2*I*B^2*a^2*b^2*c*d^3 +
 I*B^2*a^3*b*d^4)*g^3*n^2 + 20*((I*A*B + I*B^2)*b^4*c^3*d + 6*(I*A*B + I*B^
2)*a*b^3*c^2*d^2 + 6*(I*A*B + I*B^2)*a^2*b^2*c*d^3 + (I*A*B + I*B^2)*a^3*b*
d^4)*g^3*n)*x^5 + 35*((-I*B^2*b^4*c^4 - 8*I*B^2*a*b^3*c^3*d + 8*I*B^2*a^3*b
*c*d^3 + I*B^2*a^4*d^4)*g^3*n^2 + 4*((I*A*B + I*B^2)*b^4*c^4 + 16*(I*A*B +
I*B^2)*a*b^3*c^3*d + 36*(I*A*B + I*B^2)*a^2*b^2*c^2*d^2 + 16*(I*A*B + I*B^2
)*a^3*b*c*d^3 + (I*A*B + I*B^2)*a^4*d^4)*g^3*n)*x^4 + 140*((-I*B^2*a*b^3*c^
4 - 2*I*B^2*a^2*b^2*c^3*d + 2*I*B^2*a^3*b*c^2*d^2 + I*B^2*a^4*c*d^3)*g^3*n^
2 + 4*((I*A*B + I*B^2)*a*b^3*c^4 + 6*(I*A*B + I*B^2)*a^2*b^2*c^3*d + 6*(I*A
*B + I*B^2)*a^3*b*c^2*d^2 + (I*A*B + I*B^2)*a^4*c*d^3)*g^3*n)*x^3 + 70*(3*(
-I*B^2*a^2*b^2*c^4 + I*B^2*a^4*c^2*d^2)*g^3*n^2 + 4*(3*(I*A*B + I*B^2)*a^2*
b^2*c^4 + 8*(I*A*B + I*B^2)*a^3*b*c^3*d + 3*(I*A*B + I*B^2)*a^4*c^2*d^2)*g^
3*n)*x^2 + 140*((-I*B^2*a^3*b*c^4 + I*B^2*a^4*c^3*d)*g^3*n^2 + 4*((I*A*B +
I*B^2)*a^3*b*c^4 + (I*A*B + I*B^2)*a^4*c^3*d)*g^3*n)*x)*log((b*x + a)/(d*x
+ c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2
,x)
```

```
[Out] Timed out
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)^3\,(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^
2,x)
```

```
[Out] int((a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^
2, x)
```

3.179 $\int (ag+bgx)^2(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=976

$$-\frac{7B^2(bc-ad)^5g^2i^3n^2x}{180b^3d^2}-\frac{7B^2(bc-ad)^4g^2i^3n^2(c+dx)^2}{360b^2d^3}-\frac{B^2(bc-ad)^3g^2i^3n^2(c+dx)^3}{60bd^3}+\frac{B^2(bc-ad)^2g^2i^3n^2}{60d^3}$$

```
[Out] -7/180*B^2*(-a*d+b*c)^5*g^2*i^3*n^2*x/b^3/d^2-7/360*B^2*(-a*d+b*c)^4*g^2*i^
3*n^2*(d*x+c)^2/b^2/d^3-1/60*B^2*(-a*d+b*c)^3*g^2*i^3*n^2*(d*x+c)^3/b/d^3+1
/60*B^2*(-a*d+b*c)^2*g^2*i^3*n^2*(d*x+c)^4/d^3-1/60*B*(-a*d+b*c)^4*g^2*i^3*
n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/d-1/30*B*(-a*d+b*c)^3*g^2*i
^3*n*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4-1/10*B*(-a*d+b*c)^4*g^2*
i^3*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d^3+1/45*B*(-a*d+b*c)^3
*g^2*i^3*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/d^3+7/60*B*(-a*d+b*c
)^2*g^2*i^3*n*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^3-1/15*b*B*(-a*d+
b*c)*g^2*i^3*n*(d*x+c)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^3+1/60*(-a*d+b*c
)^3*g^2*i^3*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^4+1/20*(-a*d+b*c)
^2*g^2*i^3*(b*x+a)^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^3+1/10*(-a
*d+b*c)*g^2*i^3*(b*x+a)^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^2+1
/6*g^2*i^3*(b*x+a)^3*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b+1/60*B*(
-a*d+b*c)^5*g^2*i^3*n*(b*x+a)*(2*A+B*n+2*B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/d
^2+1/60*B*(-a*d+b*c)^6*g^2*i^3*n*(2*A+3*B*n+2*B*ln(e*((b*x+a)/(d*x+c))^n))*
ln((-a*d+b*c)/b/(d*x+c))/b^4/d^3+1/36*B^2*(-a*d+b*c)^6*g^2*i^3*n^2*ln((b*x+
a)/(d*x+c))/b^4/d^3+11/180*B^2*(-a*d+b*c)^6*g^2*i^3*n^2*ln(d*x+c)/b^4/d^3+1
/30*B^2*(-a*d+b*c)^6*g^2*i^3*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/d^3
```

Rubi [A]
time = 0.90, antiderivative size = 976, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 11, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.244$, Rules used = {2561, 2383, 2381, 2384, 2354, 2438, 2373, 45, 2382, 12, 907}

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2,x]
```

```
[Out] (-7*B^2*(b*c - a*d)^5*g^2*i^3*n^2*x)/(180*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g
^2*i^3*n^2*(c + d*x)^2)/(360*b^2*d^3) - (B^2*(b*c - a*d)^3*g^2*i^3*n^2*(c +
 d*x)^3)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^3*n^2*(c + d*x)^4)/(60*d^3)
- (B*(b*c - a*d)^4*g^2*i^3*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(60*b^4*d) - (B*(b*c - a*d)^3*g^2*i^3*n*(a + b*x)^3*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(30*b^4) - (B*(b*c - a*d)^4*g^2*i^3*n*(c + d*x)^2*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*b^2*d^3) + (B*(b*c - a*d)^3*g^2*i
```

```
^3*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(45*b*d^3) + (7*B*
(b*c - a*d)^2*g^2*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
/(60*d^3) - (b*B*(b*c - a*d)*g^2*i^3*n*(c + d*x)^5*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(15*d^3) + ((b*c - a*d)^3*g^2*i^3*(a + b*x)^3*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])^2)/(60*b^4) + ((b*c - a*d)^2*g^2*i^3*(a + b*x)^3*
(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(20*b^3) + ((b*c - a*d)
*g^2*i^3*(a + b*x)^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/
(10*b^2) + (g^2*i^3*(a + b*x)^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])^2)/(6*b) + (B*(b*c - a*d)^5*g^2*i^3*n*(a + b*x)*(2*A + B*n + 2*B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/(60*b^4*d^2) + (B*(b*c - a*d)^6*g^2*i^3*n*(2
*A + 3*B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*
x))])/(60*b^4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[(a + b*x)/(c + d*x)
])/(36*b^4*d^3) + (11*B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[c + d*x])/(180*b^4*
d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)
)])/(30*b^4*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
```

```
b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (179c+179dx)^3(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx = \int \left(\frac{(-bc+ad)^2g^2(179c+179dx)^3\left(A\right.}{d^2}\right.$$

$$= \frac{(b^2g^2)\int (179c+179dx)^5\left(A+B\log\left(e\right.\right.}{32041d^2}$$

$$= \frac{5735339(bc-ad)^2g^2(c+dx)^4\left(A+B\right.}{4d^3}$$

$$= \frac{5735339(bc-ad)^2g^2(c+dx)^4\left(A+B\right.}{4d^3}$$

$$= \frac{5735339(bc-ad)^2g^2(c+dx)^4\left(A+B\right.}{4d^3}$$

$$= \frac{5735339(bc-ad)^2g^2(c+dx)^4\left(A+B\right.}{4d^3}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{57353}{}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{57353}{}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{57353}{}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{57353}{}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{57353}{}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{57353}{}$$

Mathematica [A]

time = 0.93, size = 1627, normalized size = 1.67

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2,x]
```

```
[Out] (g^2*i^3*(15*(b*c - a*d)^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2 - 24*b*(b*c - a*d)*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2 + 10*b^2*(c + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (5*B*(b*c
 - a*d)^3*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c -
a*d)*Log[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2
 + 2*(b*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a
+ b*x)/(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
 + 6*(b*c - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*
B*(b*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a +
 b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)])))/b^4 + (2*B*(b*c - a*d)^2*n*(24*A*b*d*(b*c - a*d)^3*x - 12*B*
(b*c - a*d)^3*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) - 4*B*(b*c - a*d)^2*n*(2
*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) - B*(b
*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*
(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x
)*Log[e*((a + b*x)/(c + d*x))^n] + 12*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]) + 8*b^3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]) + 6*b^4*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]) + 24*(b*c - a*d)^4*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*x] - 12*B*(b*c - a*d)^4*n*(Log[a +
 b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(
a + b*x))/(-(b*c) + a*d)])))/b^4 - (B*(b*c - a*d)*n*(120*A*b*d*(b*c - a*d)^
4*x - 60*B*(b*c - a*d)^4*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) - 20*B*(b*c -
 a*d)^3*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a +
b*x]) - 5*B*(b*c - a*d)^2*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c +
 d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) - 2*B*(b*c - a*
d)*n*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b^3*(b*c
 - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b*x]) +
120*B*d*(b*c - a*d)^4*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + 60*b^2*(b*
c - a*d)^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 40*b^3*(b*c
 - a*d)^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 30*b^4*(b*c
- a*d)*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 24*b^5*(c + d*x
)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 120*(b*c - a*d)^5*Log[a + b*x]
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 120*B*(b*c - a*d)^5*n*Log[c + d*x
] - 60*B*(b*c - a*d)^5*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/
```

```
(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(6*b^4)))/(60
*d^3)
```

Maple [F]
time = 0.27, size = 0, normalized size = 0.00

$$\int (bgx + ag)^2 (dix + ci)^3 \left(A + B \ln \left(e \left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 4917 vs. 2(892) = 1784.
time = 0.90, size = 4917, normalized size = 5.04

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="maxima")
[Out] -1/3*I*A*B*b^2*d^3*g^2*x^6*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/6*I*A
^2*b^2*d^3*g^2*x^6 - 6/5*I*A*B*b^2*c*d^2*g^2*x^5*log((b*x/(d*x + c) + a/(d*
x + c))^n*e) - 4/5*I*A*B*a*b*d^3*g^2*x^5*log((b*x/(d*x + c) + a/(d*x + c))^
n*e) - 3/5*I*A^2*b^2*c*d^2*g^2*x^5 - 2/5*I*A^2*a*b*d^3*g^2*x^5 - 3/2*I*A*B*
b^2*c^2*d*g^2*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3*I*A*B*a*b*c*d^
2*g^2*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/2*I*A*B*a^2*d^3*g^2*x^
4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/4*I*A^2*b^2*c^2*d*g^2*x^4 - 3/
2*I*A^2*a*b*c*d^2*g^2*x^4 - 1/4*I*A^2*a^2*d^3*g^2*x^4 - 2/3*I*A*B*b^2*c^3*g
^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 4*I*A*B*a*b*c^2*d*g^2*x^3*l
og((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2*I*A*B*a^2*c*d^2*g^2*x^3*log((b*x/
(d*x + c) + a/(d*x + c))^n*e) - 1/3*I*A^2*b^2*c^3*g^2*x^3 - 2*I*A^2*a*b*c^2
*d*g^2*x^3 - I*A^2*a^2*c*d^2*g^2*x^3 - 2*I*A*B*a*b*c^3*g^2*x^2*log((b*x/(d*
x + c) + a/(d*x + c))^n*e) - 3*I*A*B*a^2*c^2*d*g^2*x^2*log((b*x/(d*x + c) +
 a/(d*x + c))^n*e) - I*A^2*a*b*c^3*g^2*x^2 - 3/2*I*A^2*a^2*c^2*d*g^2*x^2 +
1/180*I*A*B*b^2*d^3*g^2*n*(60*a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^
6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 +
20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b
^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) - 1/10*I*A*B*b^2*c*d^2*g^2*n*(12*a^5*log(b*
x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(
b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^
4 - a^4*d^4)*x)/(b^4*d^4)) - 1/15*I*A*B*a*b*d^3*g^2*n*(12*a^5*log(b*x + a)/
b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2
```

```
*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4
*d^4)*x)/(b^4*d^4)) + 1/4*I*A*B*b^2*c^2*d*g^2*n*(6*a^4*log(b*x + a)/b^4 - 6
*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2
*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*I*A*B*a*b*c*d^2*g^2
*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2
*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d
^3)) + 1/12*I*A*B*a^2*d^3*g^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c
)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*
(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/3*I*A*B*b^2*c^3*g^2*n*(2*a^3*log(b*x
+ a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
 a^2*d^2)*x)/(b^2*d^2)) - 2*I*A*B*a*b*c^2*d*g^2*n*(2*a^3*log(b*x + a)/b^3 -
 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*
x)/(b^2*d^2)) - I*A*B*a^2*c*d^2*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d
*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)
) + 2*I*A*B*a*b*c^3*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b
*c - a*d)*x/(b*d)) + 3*I*A*B*a^2*c^2*d*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*lo
g(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 2*I*A*B*a^2*c^3*g^2*n*(a*log(b*x +
a)/b - c*log(d*x + c)/d) - 2*I*A*B*a^2*c^3*g^2*x*log((b*x/(d*x + c) + a/(d*
x + c))^n*e) - I*A^2*a^2*c^3*g^2*x + 1/180*(74*I*a^3*b^2*c^3*d^3*g^2*n^2 -
33*I*a^4*b*c^2*d^4*g^2*n^2 + 6*I*a^5*c*d^5*g^2*n^2 - 2*(I*n^2 - 3*I*n)*b^5*
c^6*g^2 - 18*(-I*n^2 + 2*I*n)*a*b^4*c^5*d*g^2 - 9*(7*I*n^2 - 10*I*n)*a^2*b^
3*c^4*d^2*g^2)*B^2*log(d*x + c)/(b^3*d^3) + 1/30*(I*b^6*c^6*g^2*n^2 - 6*I*a
*b^5*c^5*d*g^2*n^2 + 15*I*a^2*b^4*c^4*d^2*g^2*n^2 - 20*I*a^3*b^3*c^3*d^3*g^
2*n^2 + 15*I*a^4*b^2*c^2*d^4*g^2*n^2 - 6*I*a^5*b*c*d^5*g^2*n^2 + I*a^6*d^6*
g^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
 a*d)/(b*c - a*d)))*B^2/(b^4*d^3) - 1/360*(60*I*B^2*b^6*d^6*g^2*x^6 - 24*(b
^6*c*d^5*g^2*(I*n - 9*I) + a*b^5*d^6*g^2*(-I*n - 6*I))*B^2*x^5 - 6*((-I*n^2
 + 13*I*n - 45*I)*b^6*c^2*d^4*g^2 + 2*(I*n^2 - 3*I*n - 45*I)*a*b^5*c*d^5*g^
2 + (-I*n^2 - 7*I*n - 15*I)*a^2*b^4*d^6*g^2)*B^2*x^4 - 2*((-9*I*n^2 + 38*I*
n - 60*I)*b^6*c^3*d^3*g^2 + 3*(5*I*n^2 + 14*I*n - 120*I)*a*b^5*c^2*d^4*g^2
+ 3*(-I*n^2 - 26*I*n - 60*I)*a^2*b^4*c*d^5*g^2 + (-3*I*n^2 - 2*I*n)*a^3*b^3
*d^6*g^2)*B^2*x^3 + ((11*I*n^2 - 6*I*n)*b^6*c^4*d^2*g^2 - 2*(-5*I*n^2 + 102
*I*n - 180*I)*a*b^5*c^3*d^3*g^2 - 60*(I*n^2 - 3*I*n - 9*I)*a^2*b^4*c^2*d^4*
g^2 - 2*(-23*I*n^2 - 18*I*n)*a^3*b^3*c*d^5*g^2 + (-7*I*n^2 - 6*I*n)*a^4*b^2
*d^6*g^2)*B^2*x^2 - 6*(20*I*a^3*b^3*c^3*d^3*g^2*n^2 - 15*I*a^4*b^2*c^2*d^4*
g^2*n^2 + 6*I*a^5*b*c*d^5*g^2*n^2 - I*a^6*d^6*g^2*n^2)*B^2*log(b*x + a)^2 -
 12*(-I*b^6*c^6*g^2*n^2 + 6*I*a*b^5*c^5*d*g^2*n^2 - 15*I*a^2*b^4*c^4*d^2*g^
2*n^2)*B^2*log(b*x + a)*log(d*x + c) - 6*(I*b^6*c^6*g^2*n^2 - 6*I*a*b^5*c^5
*d*g^2*n^2 + 15*I*a^2*b^4*c^4*d^2*g^2*n^2)*B^2*log(d*x + c)^2 - 2*(2*(4*I*n
^2 - 3*I*n)*b^6*c^5*d*g^2 + 3*(-17*I*n^2 + 12*I*n)*a*b^5*c^4*d^2*g^2 + (97*
I*n^2 + 30*I*n - 180*I)*a^2*b^4*c^3*d^3*g^2 + (-77*I*n^2 - 90*I*n)*a^3*b^3*
c^2*d^4*g^2 + 9*(3*I*n^2 + 4*I*n)*a^4*b^2*c*d^5*g^2 + 2*(-2*I*n^2 - 3*I*n)*
a^5*b*d^6*g^2)*B^2*x - 2*(-6*I*a*b^5*c^5*d*g^2*n^2 + 33*I*a^2*b^4*c^4*d^2*g
^2*n^2 + 2*(-17*I*n^2 - 60*I*n)*a^3*b^3*c^3*d^3*g^2 + 3*(I*n^2 + 30*I*n)*a^
4*b^2*c^2*d^4*g^2 + 6*(I*n^2 - 6*I*n)*a^5*b*c*d...
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="fricas")
```

```
[Out] 1/60*(-10*I*B^2*b^2*d^3*g^2*n^2*x^6 - 60*I*B^2*a^2*c^3*g^2*n^2*x - 12*(3*I*
B^2*b^2*c*d^2 + 2*I*B^2*a*b*d^3)*g^2*n^2*x^5 - 15*(3*I*B^2*b^2*c^2*d + 6*I*
B^2*a*b*c*d^2 + I*B^2*a^2*d^3)*g^2*n^2*x^4 - 20*(I*B^2*b^2*c^3 + 6*I*B^2*a*
b*c^2*d + 3*I*B^2*a^2*c*d^2)*g^2*n^2*x^3 - 30*(2*I*B^2*a*b*c^3 + 3*I*B^2*a^
2*c^2*d)*g^2*n^2*x^2)*log((b*x + a)/(d*x + c))^2 + integral(-1/30*(30*(I*A^
2 + 2*I*A*B + I*B^2)*b^3*d^4*g^2*x^7 + 30*(I*A^2 + 2*I*A*B + I*B^2)*a^3*c^4
*g^2 + 30*(4*(I*A^2 + 2*I*A*B + I*B^2)*b^3*c*d^3 + 3*(I*A^2 + 2*I*A*B + I*B
^2)*a*b^2*d^4)*g^2*x^6 + 90*(2*(I*A^2 + 2*I*A*B + I*B^2)*b^3*c^2*d^2 + 4*(I
*A^2 + 2*I*A*B + I*B^2)*a*b^2*c*d^3 + (I*A^2 + 2*I*A*B + I*B^2)*a^2*b*d^4)*
g^2*x^5 + 30*(4*(I*A^2 + 2*I*A*B + I*B^2)*b^3*c^3*d + 18*(I*A^2 + 2*I*A*B +
 I*B^2)*a*b^2*c^2*d^2 + 12*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b*c*d^3 + (I*A^2 +
 2*I*A*B + I*B^2)*a^3*d^4)*g^2*x^4 + 30*((I*A^2 + 2*I*A*B + I*B^2)*b^3*c^4
+ 12*(I*A^2 + 2*I*A*B + I*B^2)*a*b^2*c^3*d + 18*(I*A^2 + 2*I*A*B + I*B^2)*a
^2*b*c^2*d^2 + 4*(I*A^2 + 2*I*A*B + I*B^2)*a^3*c*d^3)*g^2*x^3 + 90*((I*A^2
+ 2*I*A*B + I*B^2)*a*b^2*c^4 + 4*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b*c^3*d + 2*
(I*A^2 + 2*I*A*B + I*B^2)*a^3*c^2*d^2)*g^2*x^2 + 30*(3*(I*A^2 + 2*I*A*B + I
*B^2)*a^2*b*c^4 + 4*(I*A^2 + 2*I*A*B + I*B^2)*a^3*c^3*d)*g^2*x + (60*(I*A*B
 + I*B^2)*b^3*d^4*g^2*n*x^7 + 60*(I*A*B + I*B^2)*a^3*c^4*g^2*n + 10*((-I*B^
2*b^3*c*d^3 + I*B^2*a*b^2*d^4)*g^2*n^2 + 6*(4*(I*A*B + I*B^2)*b^3*c*d^3 + 3
*(I*A*B + I*B^2)*a*b^2*d^4)*g^2*n)*x^6 + 12*((-3*I*B^2*b^3*c^2*d^2 + I*B^2*
a*b^2*c*d^3 + 2*I*B^2*a^2*b*d^4)*g^2*n^2 + 15*(2*(I*A*B + I*B^2)*b^3*c^2*d^
2 + 4*(I*A*B + I*B^2)*a*b^2*c*d^3 + (I*A*B + I*B^2)*a^2*b*d^4)*g^2*n)*x^5 +
 15*((-3*I*B^2*b^3*c^3*d - 3*I*B^2*a*b^2*c^2*d^2 + 5*I*B^2*a^2*b*c*d^3 + I*
B^2*a^3*d^4)*g^2*n^2 + 4*(4*(I*A*B + I*B^2)*b^3*c^3*d + 18*(I*A*B + I*B^2)*
a*b^2*c^2*d^2 + 12*(I*A*B + I*B^2)*a^2*b*c*d^3 + (I*A*B + I*B^2)*a^3*d^4)*g
^2*n)*x^4 + 20*((-I*B^2*b^3*c^4 - 5*I*B^2*a*b^2*c^3*d + 3*I*B^2*a^2*b*c^2*d
^2 + 3*I*B^2*a^3*c*d^3)*g^2*n^2 + 3*((I*A*B + I*B^2)*b^3*c^4 + 12*(I*A*B +
I*B^2)*a*b^2*c^3*d + 18*(I*A*B + I*B^2)*a^2*b*c^2*d^2 + 4*(I*A*B + I*B^2)*a
^3*c*d^3)*g^2*n)*x^3 + 30*((-2*I*B^2*a*b^2*c^4 - I*B^2*a^2*b*c^3*d + 3*I*B^
2*a^3*c^2*d^2)*g^2*n^2 + 6*((I*A*B + I*B^2)*a*b^2*c^4 + 4*(I*A*B + I*B^2)*a
^2*b*c^3*d + 2*(I*A*B + I*B^2)*a^3*c^2*d^2)*g^2*n)*x^2 + 60*((-I*B^2*a^2*b*
c^4 + I*B^2*a^3*c^3*d)*g^2*n^2 + (3*(I*A*B + I*B^2)*a^2*b*c^4 + 4*(I*A*B +
I*B^2)*a^3*c^3*d)*g^2*n)*x)*log((b*x + a)/(d*x + c)))/(b*d*x^2 + a*c + (b*c
 + a*d)*x), x)
```

Sympy [F(-1)] Timed out

time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2
,x)
```

```
[Out] Timed out
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)^2\,(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^
2,x)
```

```
[Out] int((a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^
2, x)
```

3.180 $\int (ag+bgx)(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=786

$$\frac{B^2(bc-ad)^4gi^3n^2x}{60b^3d}+\frac{B^2(bc-ad)^3gi^3n^2(c+dx)^2}{30b^2d^2}+\frac{B^2(bc-ad)^2gi^3n^2(c+dx)^3}{30bd^2}-\frac{B(bc-ad)^4gi^3n(a+bx)}{10b}$$

```
[Out] 1/60*B^2*(-a*d+b*c)^4*g*i^3*n^2*x/b^3/d+1/30*B^2*(-a*d+b*c)^3*g*i^3*n^2*(d*
x+c)^2/b^2/d^2+1/30*B^2*(-a*d+b*c)^2*g*i^3*n^2*(d*x+c)^3/b/d^2-1/10*B*(-a*d
+b*c)^4*g*i^3*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/d-1/10*B*(-a*d+
b*c)^3*g*i^3*n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4+3/20*B*(-a*d+b
*c)^3*g*i^3*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d^2+1/30*B*(-a*
d+b*c)^2*g*i^3*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/d^2-1/10*B*(-a
*d+b*c)*g*i^3*n*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^2+1/20*(-a*d+b*
c)^3*g*i^3*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^4+1/10*(-a*d+b*c)^
2*g*i^3*(b*x+a)^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^3+3/20*(-a*d+
b*c)*g*i^3*(b*x+a)^2*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^2+1/5*g*
i^3*(b*x+a)^2*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b-1/10*B*(-a*d+b*
c)^5*g*i^3*n*(A+B*n+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/b
^4/d^2-1/12*B^2*(-a*d+b*c)^5*g*i^3*n^2*ln((b*x+a)/(d*x+c))/b^4/d^2-11/60*B^
2*(-a*d+b*c)^5*g*i^3*n^2*ln(d*x+c)/b^4/d^2-1/10*B^2*(-a*d+b*c)^5*g*i^3*n^2*
polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/d^2
```

Rubi [A]

time = 0.59, antiderivative size = 786, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$, Rules used = {2561, 2383, 2381, 2384, 2354, 2438, 2373, 45, 2382, 12, 78}

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,
x]
```

```
[Out] (B^2*(b*c - a*d)^4*g*i^3*n^2*x)/(60*b^3*d) + (B^2*(b*c - a*d)^3*g*i^3*n^2*(
c + d*x)^2)/(30*b^2*d^2) + (B^2*(b*c - a*d)^2*g*i^3*n^2*(c + d*x)^3)/(30*b*
d^2) - (B*(b*c - a*d)^4*g*i^3*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]))/(10*b^4*d) - (B*(b*c - a*d)^3*g*i^3*n*(a + b*x)^2*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(10*b^4) + (3*B*(b*c - a*d)^3*g*i^3*n*(c + d*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(20*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*
n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b*d^2) - (B*(b*c
- a*d)*g*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*d^2)
 + ((b*c - a*d)^3*g*i^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2)/(20*b^4) + ((b*c - a*d)^2*g*i^3*(a + b*x)^2*(c + d*x)*(A + B*Log[e*((a +
```

```
b*x)/(c + d*x))^n])^2)/(10*b^3) + (3*(b*c - a*d)*g*i^3*(a + b*x)^2*(c + d*
x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(20*b^2) + (g*i^3*(a + b*x)^
2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b) - (B*(b*c - a
*d)^5*g*i^3*n*(A + B*n + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/
(b*(c + d*x))])/(10*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*Log[(a + b*x)/(
c + d*x)])/(12*b^4*d^2) - (11*B^2*(b*c - a*d)^5*g*i^3*n^2*Log[c + d*x])/(60
*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d
*x))])/(10*b^4*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2373

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^r)^(q + 1)*((a +
 b*Log[c*x^n])/(d*f*(m + 1))), x] - Dist[b*(n/(d*(m + 1))), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2381

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + Dist[b*n*(p/(d*(q + 1))), Int[(f*x)^
m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b, c, d
, e, f, m, n, q}, x] && EqQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2382

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_))^(q
_), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x)^q, x]}, Dist[a + b*Log[c*x
^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a,
b, c, d, e, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[m, 0]
```

Rule 2383

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_))^(q_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x)^(q + 1)*((a
+ b*Log[c*x^n])^p/(d*f*(q + 1))), x] + (Dist[(m + q + 2)/(d*(q + 1)), Int[(
f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p, x], x] + Dist[b*n*(p/(d*(q +
 1))), Int[(f*x)^m*(d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p - 1), x], x]) /;
 FreeQ[{a, b, c, d, e, f, n}, x] && ILtQ[m + q + 2, 0] && IGtQ[p, 0] && LtQ
[q, -1] && GtQ[m, 0]
```

Rule 2384

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_))^(q_.), x_Symbol] :> Simp[(f*x)^m*(d + e*x)^(q + 1)*((a + b*Log[c*x^n]
)/(e*(q + 1))), x] - Dist[f/(e*(q + 1)), Int[(f*x)^(m - 1)*(d + e*x)^(q + 1
)*(a*m + b*n + b*m*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x
] && ILtQ[q, -1] && GtQ[m, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int (180c+180dx)^3(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx = \int\left(\frac{(-bc+ad)g(180c+180dx)^3\left(A+B\right.}{d}\right.$$

$$= \frac{(bg)\int(180c+180dx)^4\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{180d}$$

$$= -\frac{1458000(bc-ad)g(c+dx)^4\left(A+B\log\right.}{d^2}$$

$$= -\frac{1458000(bc-ad)g(c+dx)^4\left(A+B\log\right.}{d^2}$$

$$= -\frac{1458000(bc-ad)g(c+dx)^4\left(A+B\log\right.}{d^2}$$

$$= -\frac{1458000(bc-ad)g(c+dx)^4\left(A+B\log\right.}{d^2}$$

$$= \frac{583200AB(bc-ad)^4gnx}{b^3d} + \frac{291600B(bc}{}$$

$$= \frac{583200AB(bc-ad)^4gnx}{b^3d} + \frac{583200B^2(bc}{}$$

$$= \frac{583200AB(bc-ad)^4gnx}{b^3d} + \frac{583200B^2(bc}{}$$

$$= \frac{583200AB(bc-ad)^4gnx}{b^3d} + \frac{97200B^2(bc}{b^3}$$

$$= \frac{583200AB(bc-ad)^4gnx}{b^3d} + \frac{97200B^2(bc}{b^3}$$

$$= \frac{583200AB(bc-ad)^4gnx}{b^3d} + \frac{97200B^2(bc}{b^3}$$

Mathematica [A]
time = 0.50, size = 945, normalized size = 1.20

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2,x]
```

```
[Out] (g*i^3*(-5*(b*c - a*d)*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
 + 4*b*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (5*B*(b*c - a
*d)^2*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c - a*d)
*Log[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2
*(b*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b*
x)/(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6
*(b*c - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*B*(b
*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a + b*x
] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c)
+ a*d)])))/(3*b^4) - (B*(b*c - a*d)*n*(24*A*b*d*(b*c - a*d)^3*x - 12*B*(b*c
 - a*d)^3*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) - 4*B*(b*c - a*d)^2*n*(2*b*d
*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) - B*(b*c -
 a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c +
 d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x)*Lo
g[e*((a + b*x)/(c + d*x))^n] + 12*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]) + 8*b^3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]) + 6*b^4*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 24*(b*c - a*d)^4*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*x] - 12*B*(b*c - a*d)^4*n*(Log[a + b*x
]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
b*x))/(-(b*c) + a*d)])))/(3*b^4)))/(20*d^2)
```

Maple [**F**]
time = 0.19, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)\left(dix+ci\right)^{3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3094 vs. 2(715) = 1430.
time = 0.85, size = 3094, normalized size = 3.94

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] -2/5*I*A*B*b*d^3*g*x^5*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/5*I*A^2*b
*d^3*g*x^5 - 3/2*I*A*B*b*c*d^2*g*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e)
```

- 1/2*I*A*B*a*d^3*g*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/4*I*A^2*b*c*d^2*g*x^4 - 1/4*I*A^2*a*d^3*g*x^4 - 2*I*A*B*b*c^2*d*g*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 2*I*A*B*a*c*d^2*g*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A^2*b*c^2*d*g*x^3 - I*A^2*a*c*d^2*g*x^3 - I*A*B*b*c^3*g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3*I*A*B*a*c^2*d*g*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/2*I*A^2*b*c^3*g*x^2 - 3/2*I*A^2*a*c^2*d*g*x^2 - 1/30*I*A*B*b*d^3*g*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) + 1/4*I*A*B*b*c*d^2*g*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/12*I*A*B*a*d^3*g*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - I*A*B*b*c^2*d*g*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - I*A*B*a*c*d^2*g*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + I*A*B*b*c^3*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 3*I*A*B*a*c^2*d*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 2*I*A*B*a*c^3*g*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) - 2*I*A*B*a*c^3*g*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A^2*a*c^3*g*x + 1/60*(47*I*a^2*b^2*c^3*d^2*g*n^2 - 27*I*a^3*b*c^2*d^3*g*n^2 + 6*I*a^4*c*d^4*g*n^2 + (5*I*n^2 - 6*I*n)*b^4*c^5*g + (-31*I*n^2 + 30*I*n)*a*b^3*c^4*d*g)*B^2*log(d*x + c)/(b^3*d^2) + 1/10*(-I*b^5*c^5*g*n^2 + 5*I*a*b^4*c^4*d*g*n^2 - 10*I*a^2*b^3*c^3*d^2*g*n^2 + 10*I*a^3*b^2*c^2*d^3*g*n^2 - 5*I*a^4*b*c*d^4*g*n^2 + I*a^5*d^5*g*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^2) - 1/60*(12*I*B^2*b^5*d^5*g*x^5 - 3*(b^5*c*d^4*g*(2*I*n - 15*I) + a*b^4*d^5*g*(-2*I*n - 5*I))*B^2*x^4 - 2*((-I*n^2 + 11*I*n - 30*I)*b^5*c^2*d^3*g + 2*(I*n^2 - 5*I*n - 15*I)*a*b^4*c*d^4*g + (-I*n^2 - I*n)*a^2*b^3*d^5*g)*B^2*x^3 + ((8*I*n^2 - 27*I*n + 30*I)*b^5*c^3*d^2*g - 3*(6*I*n^2 - 5*I*n - 30*I)*a*b^4*c^2*d^3*g - 3*(-4*I*n^2 - 5*I*n)*a^2*b^3*c*d^4*g + (-2*I*n^2 - 3*I*n)*a^3*b^2*d^5*g)*B^2*x^2 - 3*(10*I*a^2*b^3*c^3*d^2*g*n^2 - 10*I*a^3*b^2*c^2*d^3*g*n^2 + 5*I*a^4*b*c*d^4*g*n^2 - I*a^5*d^5*g*n^2)*B^2*log(b*x + a)^2 - 6*(I*b^5*c^5*g*n^2 - 5*I*a*b^4*c^4*d*g*n^2)*B^2*log(b*x + a)*log(d*x + c) - 3*(-I*b^5*c^5*g*n^2 + 5*I*a*b^4*c^4*d*g*n^2)*B^2*log(d*x + c)^2 + ((11*I*n^2 - 6*I*n)*b^5*c^4*d*g - 2*(14*I*n^2 + 15*I*n - 30*I)*a*b^4*c^3*d^2*g - 12*(-2*I*n^2 - 5*I*n)*a^2*b^3*c^2*d^3*g - 2*(4*I*n^2 + 15*I*n)*a^3*b^2*c*d^4*g + (I*n^2 + 6*I*n)*a^4*b*d^5*g)*B^2*x + (-6*I*a*b^4*c^4*d*g*n^2 - 3*(I*n^2 - 20*I*n)*a^2*b^3*c^3*d^2*g + (23*I*n^2 - 60*I*n)*a^3*b^2*c^2*d^3*g + (-19*I*n^2 + 30*I*n)*a^4*b*c*d^4*g + (5*I*n^2 - 6*I*n)*a^5*d^5*g)*B^2*log(b*x + a) - 3*(-4*I*B^2*b^5*d^5*g*x^5 - 20*I*B^2*a*b^4*c^3*d^2*g*x + 5*(-3*I*b^5*c*d^4*g - I*a*b^4*d^5*g)*B^2*x^4 + 20*(-I*b^5*c^2*d^3*g - I*a*b^4*c*d^4*g)*B^2*x^3 + 10*(-I*b^5*c^3*d^2*g - 3*I*a*b^4*c^2*d^3*g)*B^2*x^2)*log((b*x + a)^n)^2 - 3*(-4*I*B^2*b^5*d^5*g*x^5 - 20*I*B^2*a*b^4*c^3*d^2*g*x + 5*(-3*I*

```
b^5*c*d^4*g - I*a*b^4*d^5*g)*B^2*x^4 + 20*(-I*b^5*c^2*d^3*g - I*a*b^4*c*d^4
*g)*B^2*x^3 + 10*(-I*b^5*c^3*d^2*g - 3*I*a*b^4*c^2*d^3*g)*B^2*x^2)*log((d*x
 + c)^n)^2 + (24*I*B^2*b^5*d^5*g*x^5 - 6*(b^5*c*d^4*g*(I*n - 15*I) + a*b^4*
d^5*g*(-I*n - 5*I))*B^2*x^4 - 2*(-I*a^2*b^3*d^5*g*n + b^5*c^2*d^3*g*(11*I*n
 - 60*I) + 10*a*b^4*c*d^4*g*(-I*n - 6*I))*B^2*x^3 - 3*(-5*I*a^2*b^3*c*d^4*g
*n + I*a^3*b^2*d^5*g*n + b^5*c^3*d^2*g*(9*I*n - 20*I) + 5*a*b^4*c^2*d^3*g*(
-I*n - 12*I))*B^2*x^2 - 6*(I*b^5*c^4*d*g*n - 10*I*a^2*b^3*c^2*d^3*g*n + 5*I
*a^3*b^2*c*d^4*g*n - I*a^4*b*d^5*g*n + 5*a*b^4*c^3*d^2*g*(I*n - 4*I))*B^2*x
 - 6*(-10*I*a^2*b^3*c^3*d^2*g*n + 10*I*a^3*b^2*c^2*d^3*g*n - 5*I*a^4*b*c*d^
4*g*n + I*a^5*d^5*g*n)*B^2*log(b*x + a) - 6*(-I*b^5*c^5*g*n + 5*I*a*b^4*c^4
*d*g*n)*B^2*log(d*x + c))*log((b*x + a)^n) + (-24*I*B^2*b^5*d^5*g*x^5 - 6*(
a*b^4*d^5*g*(I*n + 5*I) + b^5*c*d^4*g*(-I*n + 15*I))*B^2*x^4 - 2*(I*a^2*b^3
*d^5*g*n + 10*a*b^4*c*d^4*g*(I*n + 6*I) + b^5*c^2*d^3*g*(-11*I*n + 60*I))*B
^2*x^3 - 3*(5*I*a^2*b^3*c*d^4*g*n - I*a^3*b^2*d^5*g*n + 5*a*b^4*c^2*d^3*g*(
I*n + 12*I) + b^5*c^3*d^2*g*(-9*I*n + 20*I))*B^2*x^2 - 6*(-I*b^5*c^4*d*g*n
+ 10*I*a^2*b^3*c^2*d^3*g*n - 5*I*a^3*b^2*c*d^4*g*n + I*a^4*b*d^5*g*n + 5*a*
b^4*c^3*d^2*g*(-I*n + 4*I))*B^2*x - 6*(10*I*a^2*b^3*c^3*d^2*g*n - 10*I*a^3*
b^2*c^2*d^3*g*n + 5*I*a^4*b*c*d^4*g*n - I*a^5*d^5*g*n)*B^2*log(b*x + a) - 6
*(I*b^5*c^5*g*n - 5*I*a*b^4*c^4*d*g*n)*B^2*log(d*x + c) - 6*(4*I*B^2*b^5*d^
5*g*x^5 + 20*I*B^2*a*b^4*c^3*d^2*g*x + 5*(3*I*b...
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="fricas")
```

```
[Out] 1/20*(-4*I*B^2*b*d^3*g*n^2*x^5 - 20*I*B^2*a*c^3*g*n^2*x - 5*(3*I*B^2*b*c*d^
2 + I*B^2*a*d^3)*g*n^2*x^4 - 20*(I*B^2*b*c^2*d + I*B^2*a*c*d^2)*g*n^2*x^3 -
 10*(I*B^2*b*c^3 + 3*I*B^2*a*c^2*d)*g*n^2*x^2)*log((b*x + a)/(d*x + c))^2 +
 integral(-1/10*(10*(I*A^2 + 2*I*A*B + I*B^2)*b^2*d^4*g*x^6 + 10*(I*A^2 + 2
*I*A*B + I*B^2)*a^2*c^4*g + 20*(2*(I*A^2 + 2*I*A*B + I*B^2)*b^2*c*d^3 + (I*
A^2 + 2*I*A*B + I*B^2)*a*b*d^4)*g*x^5 + 10*(6*(I*A^2 + 2*I*A*B + I*B^2)*b^2
*c^2*d^2 + 8*(I*A^2 + 2*I*A*B + I*B^2)*a*b*c*d^3 + (I*A^2 + 2*I*A*B + I*B^2
)*a^2*d^4)*g*x^4 + 40*((I*A^2 + 2*I*A*B + I*B^2)*b^2*c^3*d + 3*(I*A^2 + 2*I
*A*B + I*B^2)*a*b*c^2*d^2 + (I*A^2 + 2*I*A*B + I*B^2)*a^2*c*d^3)*g*x^3 + 10
*((I*A^2 + 2*I*A*B + I*B^2)*b^2*c^4 + 8*(I*A^2 + 2*I*A*B + I*B^2)*a*b*c^3*d
 + 6*(I*A^2 + 2*I*A*B + I*B^2)*a^2*c^2*d^2)*g*x^2 + 20*((I*A^2 + 2*I*A*B +
I*B^2)*a*b*c^4 + 2*(I*A^2 + 2*I*A*B + I*B^2)*a^2*c^3*d)*g*x + (20*(I*A*B +
I*B^2)*b^2*d^4*g*n*x^6 + 20*(I*A*B + I*B^2)*a^2*c^4*g*n + 4*((-I*B^2*b^2*c*
d^3 + I*B^2*a*b*d^4)*g*n^2 + 10*(2*(I*A*B + I*B^2)*b^2*c*d^3 + (I*A*B + I*B
^2)*a*b*d^4)*g*n)*x^5 + 5*((-3*I*B^2*b^2*c^2*d^2 + 2*I*B^2*a*b*c*d^3 + I*B^
```

```
2*a^2*d^4)*g*n^2 + 4*(6*(I*A*B + I*B^2)*b^2*c^2*d^2 + 8*(I*A*B + I*B^2)*a*b
*c*d^3 + (I*A*B + I*B^2)*a^2*d^4)*g*n)*x^4 + 20*((-I*B^2*b^2*c^3*d + I*B^2*
a^2*c*d^3)*g*n^2 + 4*((I*A*B + I*B^2)*b^2*c^3*d + 3*(I*A*B + I*B^2)*a*b*c^2
*d^2 + (I*A*B + I*B^2)*a^2*c*d^3)*g*n)*x^3 + 10*((-I*B^2*b^2*c^4 - 2*I*B^2*
a*b*c^3*d + 3*I*B^2*a^2*c^2*d^2)*g*n^2 + 2*((I*A*B + I*B^2)*b^2*c^4 + 8*(I*
A*B + I*B^2)*a*b*c^3*d + 6*(I*A*B + I*B^2)*a^2*c^2*d^2)*g*n)*x^2 + 20*((-I*
B^2*a*b*c^4 + I*B^2*a^2*c^3*d)*g*n^2 + 2*((I*A*B + I*B^2)*a*b*c^4 + 2*(I*A*
B + I*B^2)*a^2*c^3*d)*g*n)*x)*log((b*x + a)/(d*x + c)))/(b*d*x^2 + a*c + (b
*c + a*d)*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int (a\,g+b\,g\,x)\,{(c\,i+d\,i\,x)}^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,
x)
```

```
[Out] int((a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,
 x)
```

3.181 $\int (ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=454

$$\frac{5B^2(bc-ad)^3i^3n^2x}{12b^3}+\frac{B^2(bc-ad)^2i^3n^2(c+dx)^2}{12b^2d}-\frac{B(bc-ad)^3i^3n(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^4}-\frac{B(bc-$$

```
[Out] 5/12*B^2*(-a*d+b*c)^3*i^3*n^2*x/b^3+1/12*B^2*(-a*d+b*c)^2*i^3*n^2*(d*x+c)^2
/b^2/d-1/2*B*(-a*d+b*c)^3*i^3*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4
-1/4*B*(-a*d+b*c)^2*i^3*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d-1
/6*B*(-a*d+b*c)*i^3*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/d+1/4*i^3
*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d+5/12*B^2*(-a*d+b*c)^4*i^3*n^
2*ln((b*x+a)/(d*x+c))/b^4/d+11/12*B^2*(-a*d+b*c)^4*i^3*n^2*ln(d*x+c)/b^4/d+
1/2*B*(-a*d+b*c)^4*i^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(
b*x+a))/b^4/d-1/2*B^2*(-a*d+b*c)^4*i^3*n^2*polylog(2,b*(d*x+c)/d/(b*x+a))/b
^4/d
```

Rubi [A]
time = 0.36, antiderivative size = 454, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {2551, 2356, 2389, 2379, 2438, 2351, 31, 46}

$$-\frac{B^2i^3n^2(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{2b^4d}+\frac{Bi^3n(bc-ad)^4\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4d}-\frac{Bi^3n(a+bx)(bc-ad)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4}-\frac{Bi^3n(c+dx)^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4b^2d}-\frac{Bi^3n(c+dx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6bd}+\frac{i^3(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{4d}+\frac{5B^2i^3n^2(bc-ad)^4\log\left(\frac{a+bx}{c+dx}\right)}{12b^4d}+\frac{11B^2i^3n^2(bc-ad)^4\log(c+dx)}{12b^4d}+\frac{5B^2i^3n^2x(bc-ad)^3}{12b^3}+\frac{B^2i^3n^2(c+dx)^2(bc-ad)^2}{12b^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (5*B^2*(b*c - a*d)^3*i^3*n^2*x)/(12*b^3) + (B^2*(b*c - a*d)^2*i^3*n^2*(c +
d*x)^2)/(12*b^2*d) - (B*(b*c - a*d)^3*i^3*n*(a + b*x)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/(2*b^4) - (B*(b*c - a*d)^2*i^3*n*(c + d*x)^2*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(4*b^2*d) - (B*(b*c - a*d)*i^3*n*(c + d*x)^3*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*d) + (i^3*(c + d*x)^4*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])^2)/(4*d) + (5*B^2*(b*c - a*d)^4*i^3*n^2*Log[(
a + b*x)/(c + d*x)])/(12*b^4*d) + (11*B^2*(b*c - a*d)^4*i^3*n^2*Log[c + d*x
])/(12*b^4*d) + (B*(b*c - a*d)^4*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(2*b^4*d) - (B^2*(b*c - a*d)^4*i^3
*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(2*b^4*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2551

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(m +
1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c -
```

```
 a*d, 0] && IntegersQ[m, p] && EqQ[d*f - c*g, 0] && (GtQ[p, 0] || LtQ[m, -1
])
```

Rubi steps

$$\int (181c+181dx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{5929741(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d} - \frac{(Bn}{}$$

$$= \frac{5929741(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d} - \frac{(592}{}$$

$$= \frac{5929741(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d} - \frac{(592}{}$$

$$= \frac{5929741(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d} - \frac{(592}{}$$

$$= -\frac{5929741AB(bc-ad)^3nx}{2b^3} - \frac{5929741B(bc-ad)^2}{}$$

$$= -\frac{5929741AB(bc-ad)^3nx}{2b^3} - \frac{5929741B^2(bc-ad)}{}$$

$$= -\frac{5929741AB(bc-ad)^3nx}{2b^3} - \frac{5929741B^2(bc-ad)}{}$$

$$= -\frac{5929741AB(bc-ad)^3nx}{2b^3} + \frac{29648705B^2(bc-ac}{12b^3}$$

$$= -\frac{5929741AB(bc-ad)^3nx}{2b^3} + \frac{29648705B^2(bc-ac}{12b^3}$$

$$= -\frac{5929741AB(bc-ad)^3nx}{2b^3} + \frac{29648705B^2(bc-ac}{12b^3}$$

Mathematica [A]
time = 0.22, size = 409, normalized size = 0.90

$$\frac{i^3\left((c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - \frac{B(bc-ad)n\left(6Abd(bc-ad)^2x-3B(bc-ad)^2n(bdx+(bc-ad)\log(a+bx))-B(bc-ad)n\left(2bd(bc-ad)x+b^2(c+dx)^2+2(bc-ad)^2\log(a+bx)\right)+6Bd(bc-ad)^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3b^2(bc-ad)(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2b^3(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+6(bc-ad)^3\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-6B(bc-ad)^3n\log(c+dx)-3B(bc-ad)^3n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)}{3b^4}\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (i^3*((c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c - a*d)*Log[
a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c
 - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b*x)/(c
 + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*(b*c
 - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*B*(b*c -
a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a + b*x] - 2
*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d
)]))/(3*b^4)))/(4*d)
```

Maple [**F**]
time = 0.16, size = 0, normalized size = 0.00

$$\int (dix+ci)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1764 vs. 2(408) = 816.
time = 0.78, size = 1764, normalized size = 3.89

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] -1/2*I*A*B*d^3*x^4*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*I*A^2*d^3*x
^4 - 2*I*A*B*c*d^2*x^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A^2*c*d^2
*x^3 - 3*I*A*B*c^2*d*x^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 3/2*I*A^2
*c^2*d*x^2 + 1/12*I*A*B*d^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/
d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b
^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - I*A*B*c*d^2*n*(2*a^3*log(b*x + a)/b^3 - 2
*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)
/(b^2*d^2)) + 3*I*A*B*c^2*d*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
+ (b*c - a*d)*x/(b*d)) - 2*I*A*B*c^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d
) - 2*I*A*B*c^3*x*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - I*A^2*c^3*x + 1/
12*(26*I*a*b^2*c^3*d*n^2 - 21*I*a^2*b*c^2*d^2*n^2 + 6*I*a^3*c*d^3*n^2 + (-1
1*I*n^2 + 6*I*n)*b^3*c^4)*B^2*log(d*x + c)/(b^3*d) + 1/2*(I*b^4*c^4*n^2 - 4
*I*a*b^3*c^3*d*n^2 + 6*I*a^2*b^2*c^2*d^2*n^2 - 4*I*a^3*b*c*d^3*n^2 + I*a^4*
d^4*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
```

```
a*d)/(b*c - a*d)))*B^2/(b^4*d) - 1/12*(3*I*B^2*b^4*d^4*x^4 + 6*I*B^2*b^4*c
^4*n^2*log(b*x + a)*log(d*x + c) - 3*I*B^2*b^4*c^4*n^2*log(d*x + c)^2 - 2*(
-I*a*b^3*d^4*n + b^4*c*d^3*(I*n - 6*I))*B^2*x^3 + ((I*n^2 - 9*I*n + 18*I)*b
^4*c^2*d^2 - 2*(I*n^2 - 6*I*n)*a*b^3*c*d^3 + (I*n^2 - 3*I*n)*a^2*b^2*d^4)*B
^2*x^2 - 3*(4*I*a*b^3*c^3*d*n^2 - 6*I*a^2*b^2*c^2*d^2*n^2 + 4*I*a^3*b*c*d^3
*n^2 - I*a^4*d^4*n^2)*B^2*log(b*x + a)^2 + ((7*I*n^2 - 18*I*n + 12*I)*b^4*c
^3*d + (-19*I*n^2 + 36*I*n)*a*b^3*c^2*d^2 + (17*I*n^2 - 24*I*n)*a^2*b^2*c*d
^3 + (-5*I*n^2 + 6*I*n)*a^3*b*d^4)*B^2*x - (6*(3*I*n^2 - 4*I*n)*a*b^3*c^3*d
 + 9*(-5*I*n^2 + 4*I*n)*a^2*b^2*c^2*d^2 + 2*(19*I*n^2 - 12*I*n)*a^3*b*c*d^3
 - (11*I*n^2 - 6*I*n)*a^4*d^4)*B^2*log(b*x + a) - 3*(-I*B^2*b^4*d^4*x^4 - 4
*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4*c^2*d^2*x^2 - 4*I*B^2*b^4*c^3*d*x)*log((
b*x + a)^n)^2 - 3*(-I*B^2*b^4*d^4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4
*c^2*d^2*x^2 - 4*I*B^2*b^4*c^3*d*x)*log((d*x + c)^n)^2 + (6*I*B^2*b^4*d^4*x
^4 - 6*I*B^2*b^4*c^4*n*log(d*x + c) - 2*(-I*a*b^3*d^4*n + b^4*c*d^3*(I*n -
12*I))*B^2*x^3 - 3*(-4*I*a*b^3*c*d^3*n + I*a^2*b^2*d^4*n + 3*b^4*c^2*d^2*(I
*n - 4*I))*B^2*x^2 - 6*(-6*I*a*b^3*c^2*d^2*n + 4*I*a^2*b^2*c*d^3*n - I*a^3*
b*d^4*n + b^4*c^3*d*(3*I*n - 4*I))*B^2*x - 6*(-4*I*a*b^3*c^3*d*n + 6*I*a^2*
b^2*c^2*d^2*n - 4*I*a^3*b*c*d^3*n + I*a^4*d^4*n)*B^2*log(b*x + a))*log((b*x
 + a)^n) + (-6*I*B^2*b^4*d^4*x^4 + 6*I*B^2*b^4*c^4*n*log(d*x + c) - 2*(I*a*
b^3*d^4*n + b^4*c*d^3*(-I*n + 12*I))*B^2*x^3 - 3*(4*I*a*b^3*c*d^3*n - I*a^2
*b^2*d^4*n + 3*b^4*c^2*d^2*(-I*n + 4*I))*B^2*x^2 - 6*(6*I*a*b^3*c^2*d^2*n -
 4*I*a^2*b^2*c*d^3*n + I*a^3*b*d^4*n + b^4*c^3*d*(-3*I*n + 4*I))*B^2*x - 6*
(4*I*a*b^3*c^3*d*n - 6*I*a^2*b^2*c^2*d^2*n + 4*I*a^3*b*c*d^3*n - I*a^4*d^4*
n)*B^2*log(b*x + a) - 6*(I*B^2*b^4*d^4*x^4 + 4*I*B^2*b^4*c*d^3*x^3 + 6*I*B^
2*b^4*c^2*d^2*x^2 + 4*I*B^2*b^4*c^3*d*x)*log((b*x + a)^n))*log((d*x + c)^n)
)/(b^4*d)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] 1/4*(-I*B^2*d^3*n^2*x^4 - 4*I*B^2*c*d^2*n^2*x^3 - 6*I*B^2*c^2*d*n^2*x^2 - 4
*I*B^2*c^3*n^2*x)*log((b*x + a)/(d*x + c))^2 + integral(-1/2*(2*(I*A^2 + 2*
I*A*B + I*B^2)*b*d^4*x^5 + 2*(I*A^2 + 2*I*A*B + I*B^2)*a*c^4 + 2*(4*(I*A^2
+ 2*I*A*B + I*B^2)*b*c*d^3 + (I*A^2 + 2*I*A*B + I*B^2)*a*d^4)*x^4 + 4*(3*(I
*A^2 + 2*I*A*B + I*B^2)*b*c^2*d^2 + 2*(I*A^2 + 2*I*A*B + I*B^2)*a*c*d^3)*x^
3 + 4*(2*(I*A^2 + 2*I*A*B + I*B^2)*b*c^3*d + 3*(I*A^2 + 2*I*A*B + I*B^2)*a*
c^2*d^2)*x^2 + 2*((I*A^2 + 2*I*A*B + I*B^2)*b*c^4 + 4*(I*A^2 + 2*I*A*B + I*
B^2)*a*c^3*d)*x + (4*(I*A*B + I*B^2)*b*d^4*n*x^5 + 4*(I*A*B + I*B^2)*a*c^4*
n - ((I*B^2*b*c*d^3 - I*B^2*a*d^4)*n^2 - 4*(4*(I*A*B + I*B^2)*b*c*d^3 + (I*
```

```
A*B + I*B^2)*a*d^4)*n)*x^4 + 4*((-I*B^2*b*c^2*d^2 + I*B^2*a*c*d^3)*n^2 + 2*
(3*(I*A*B + I*B^2)*b*c^2*d^2 + 2*(I*A*B + I*B^2)*a*c*d^3)*n)*x^3 + 2*(3*(-I
*B^2*b*c^3*d + I*B^2*a*c^2*d^2)*n^2 + 4*(2*(I*A*B + I*B^2)*b*c^3*d + 3*(I*A
*B + I*B^2)*a*c^2*d^2)*n)*x^2 + 4*((-I*B^2*b*c^4 + I*B^2*a*c^3*d)*n^2 + ((I
*A*B + I*B^2)*b*c^4 + 4*(I*A*B + I*B^2)*a*c^3*d)*n)*x)*log((b*x + a)/(d*x +
 c)))/(b*d*x^2 + a*c + (b*c + a*d)*x), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$i^{3}\left(\int A^{2}c^{3}\,dx + \int A^{2}d^{3}x^{3}\,dx + \int B^{2}c^{3}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)^{2}dx + \int 2ABc^{3}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)dx + \int 3A^{2}cd^{2}x^{2}\,dx + \int 3A^{2}c^{2}dx\,dx + \int B^{2}d^{3}x^{3}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)^{2}dx + \int 2ABd^{3}x^{3}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)dx + \int 3B^{2}cd^{2}x^{2}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)^{2}dx + \int 3B^{2}c^{2}dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)^{2}dx + \int 6ABcd^{2}x^{2}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)dx + \int 6ABc^{2}dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] i**3*(Integral(A**2*c**3, x) + Integral(A**2*d**3*x**3, x) + Integral(B**2*
c**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(2*A*B*c**3*l
og(e*(a/(c + d*x) + b*x/(c + d*x))**n), x) + Integral(3*A**2*c*d**2*x**2, x
) + Integral(3*A**2*c**2*d*x, x) + Integral(B**2*d**3*x**3*log(e*(a/(c + d*
x) + b*x/(c + d*x))**n)**2, x) + Integral(2*A*B*d**3*x**3*log(e*(a/(c + d*x
) + b*x/(c + d*x))**n), x) + Integral(3*B**2*c*d**2*x**2*log(e*(a/(c + d*x)
 + b*x/(c + d*x))**n)**2, x) + Integral(3*B**2*c**2*d*x*log(e*(a/(c + d*x)
+ b*x/(c + d*x))**n)**2, x) + Integral(6*A*B*c*d**2*x**2*log(e*(a/(c + d*x)
 + b*x/(c + d*x))**n), x) + Integral(6*A*B*c**2*d*x*log(e*(a/(c + d*x) + b*
x/(c + d*x))**n), x))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((I*d*x + I*c)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int (c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

3.182 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=762

$$\frac{B^2d(bc-ad)^2i^3n^2x}{3b^3g}-\frac{5Bd(bc-ad)^2i^3n(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^4g}-\frac{B(bc-ad)i^3n(c+dx)^2\left(A+B\right.}{3b^2g}$$

```
[Out] 1/3*B^2*d*(-a*d+b*c)^2*i^3*n^2*x/b^3/g-5/3*B*d*(-a*d+b*c)^2*i^3*n*(b*x+a)*(
A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/g-1/3*B*(-a*d+b*c)*i^3*n*(d*x+c)^2*(A+B*
ln(e*((b*x+a)/(d*x+c))^n))/b^2/g+d*(-a*d+b*c)^2*i^3*(b*x+a)*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))^2/b^4/g+1/2*(-a*d+b*c)*i^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d
*x+c))^n))^2/b^2/g+1/3*i^3*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b/g+
2*B*(-a*d+b*c)^3*i^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x
+c))/b^4/g+1/3*B^2*(-a*d+b*c)^3*i^3*n^2*ln((b*x+a)/(d*x+c))/b^4/g+2*B^2*(-a
*d+b*c)^3*i^3*n^2*ln(d*x+c)/b^4/g+5/3*B*(-a*d+b*c)^3*i^3*n*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g-(-a*d+b*c)^3*i^3*(A+B*ln(e*
((b*x+a)/(d*x+c))^n))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g+2*B^2*(-a*d+b*c)^3*
i^3*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/g-5/3*B^2*(-a*d+b*c)^3*i^3*n^2*p
olylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g+2*B*(-a*d+b*c)^3*i^3*n*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g+2*B^2*(-a*d+b*c)^3*i^3
*n^2*polylog(3,b*(d*x+c)/d/(b*x+a))/b^4/g
```

Rubi [A]
time = 0.77, antiderivative size = 762, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 12, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2561, 2389, 2379, 2421, 6724, 2355, 2354, 2438, 2356, 2351, 31, 46}

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
),x]
```

```
[Out] (B^2*d*(b*c - a*d)^2*i^3*n^2*x)/(3*b^3*g) - (5*B*d*(b*c - a*d)^2*i^3*n*(a +
 b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^4*g) - (B*(b*c - a*d)*i^
3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2*g) + (d*(b*c
 - a*d)^2*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g) +
 ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*
b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b*g)
 + (2*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c
 - a*d)/(b*(c + d*x))])/(b^4*g) + (B^2*(b*c - a*d)^3*i^3*n^2*Log[(a + b*x)/
(c + d*x)])/(3*b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*n^2*Log[c + d*x])/(b^4*g)
+ (5*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (
```

```
b*(c + d*x))/(d*(a + b*x))])/(3*b^4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (
2*B^2*(b*c - a*d)^3*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g
) - (5*B^2*(b*c - a*d)^3*i^3*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(
3*b^4*g) + (2*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*
PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (2*B^2*(b*c - a*d)^3*i^3
*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
```

```
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(182c+182dx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{6028568d(bc-ad)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{3312\cdots}{}\right.$$

$$= \frac{(6028568(bc-ad)^3)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx}{b^3} + \frac{(182d)\int(\cdots}{}$$

$$= \frac{6028568d(bc-ad)^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{3014284(\cdots}{}$$

$$= \frac{6028568d(bc-ad)^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{3014284(\cdots}{}$$

$$= \frac{6028568d(bc-ad)^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{3014284(\cdots}{}$$

$$= \frac{6028568d(bc-ad)^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{3014284(\cdots}{}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} - \frac{6028568B(bc-ad)n(c+\cdots}{3\cdots}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} - \frac{30142840B^2d(bc-ad)^2n\cdots}{3b^4\cdots}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} - \frac{30142840B^2d(bc-ad)^2n\cdots}{3b^4\cdots}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2\cdots}{3b^3g}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2\cdots}{3b^3g}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2\cdots}{3b^3g}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2\cdots}{3b^3g}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2\cdots}{3b^3g}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2\cdots}{3b^3g}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 2949 vs. $2(762) = 1524$.
time = 3.17, size = 2949, normalized size = 3.87

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x),x]
```

```
[Out] (i^3*(6*b*d*(3*b^2*c^2 - 3*a*b*c*d + a^2*d^2)*x*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 3*b^2*d^2*(3*b*c - a*d)*x^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 2
*b^3*d^3*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c +
 d*x)])^2 + 6*(b*c - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))
^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 - 18*b^2*B*c^2*n*(A + B*Log[e*((a + b
*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(a*d*Log[a/b + x]^2 - 2*a
*d*Log[a/b + x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*(b*c +
a*d*Log[a + b*x] - a*d*Log[(d*(a + b*x))/(-(b*c) + a*d)]) + (-(b*d*x) + a*d
*Log[a + b*x])*Log[(a + b*x)/(c + d*x)]) - 2*a*d*PolyLog[2, (b*(c + d*x))/(
b*c - a*d)]) - 2*B*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a +
b*x)/(c + d*x)])*(6*a^2*b*c*d^2 - 6*a^3*d^3 + 2*b^3*c^2*d*x + 3*a*b^2*c*d^2
*x - 5*a^2*b*d^3*x - b^3*c*d^2*x^2 + a*b^2*d^3*x^2 - 3*a^3*d^3*Log[a/b + x]
^2 - 6*a^2*b*c*d^2*Log[c/d + x] + 5*a^3*d^3*Log[a + b*x] - 6*a^3*d^3*Log[c/
d + x]*Log[a + b*x] + 6*a^3*d^3*Log[a/b + x]*(1 + Log[a + b*x]) + 6*a^3*d^3
*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 6*a^2*b*d^3*x*Log[(a + b*
x)/(c + d*x)] - 3*a*b^2*d^3*x^2*Log[(a + b*x)/(c + d*x)] + 2*b^3*d^3*x^3*Lo
g[(a + b*x)/(c + d*x)] - 6*a^3*d^3*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] -
2*b^3*c^3*Log[c + d*x] - 3*a*b^2*c^2*d*Log[c + d*x] + 6*a^3*d^3*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)]) + 6*b^3*B*c^3*n*(A + B*Log[e*((a + b*x)/(c + d*
x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Lo
g[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) - 2*(Log[c/d + x]*Log
[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) +
9*b*B*c*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*
x)])*(-4*a*d^2*(a + b*x)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^2 + 4
*a*b*d*(c + d*x)*(-1 + Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2*Log
[a/b + x] - 2*a^2*Log[a + b*x]) - 2*d^2*(b*x*(-2*a + b*x) + 2*a^2*Log[a + b
*x])*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) + b^2*(d*x*(-
2*c + d*x) - 2*d^2*x^2*Log[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*(Log[
c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])) + 6*b^2*B^2*c^2*n^2*(Log[(a + b*x)/(c + d*x)]*(-(a*d*Log[(a + b*x
)/(c + d*x)]^2) + 6*(b*c - a*d)*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*d*Log[(a
 + b*x)/(c + d*x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c + b*d*x)])) + 6*(b*c -
 a*d + a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) - 3*b*B^2*c*n^2*(6*b^2*c
```

```
^2*Log[(b*(b*c - a*d))/(c + d*x)] + 6*a^2*d^2*Log[(b*(b*c - a*d))/(c + d*x)
] - 12*a*b*c*d*Log[(b^2*(b*c - a*d))/(c + d*x)] + 6*a*b*c*d*Log[(a + b*x)/(
c + d*x)] - 6*a^2*d^2*Log[(a + b*x)/(c + d*x)] + 6*b^2*c*d*x*Log[(a + b*x)/
(c + d*x)] - 6*a*b*d^2*x*Log[(a + b*x)/(c + d*x)] + 9*a^2*d^2*Log[(a + b*x)
/(c + d*x)]^2 + 6*a*b*d^2*x*Log[(a + b*x)/(c + d*x)]^2 - 3*b^2*d^2*x^2*Log[
(a + b*x)/(c + d*x)]^2 - 2*a^2*d^2*Log[(a + b*x)/(c + d*x)]^3 + 6*b^2*c^2*L
og[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 12*a*b*c*d*Log[(a
+ b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 18*a^2*d^2*Log[(a + b*x)
/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*a^2*d^2*Log[(a + b*x)/(c + d
*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*(b^2*c^2 + 2*a*b*c*d - 3*a^2*d^2
+ 2*a^2*d^2*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)
)] - 12*a^2*d^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) + B^2*n^2*(2*b^3*c
^3 - 4*a*b^2*c^2*d + 2*a^2*b*c*d^2 + 2*b^3*c^2*d*x - 4*a*b^2*c*d^2*x + 2*a^
2*b*d^3*x + 6*b^3*c^3*Log[(b*(b*c - a*d))/(c + d*x)] - 18*a^2*b*c*d^2*Log[(
b*(b*c - a*d))/(c + d*x)] + 12*a^3*d^3*Log[(b*(b*c - a*d))/(c + d*x)] + 4*a
*b^2*c^2*d*Log[(a + b*x)/(c + d*x)] + 8*a^2*b*c*d^2*Log[(a + b*x)/(c + d*x)
] - 12*a^3*d^3*Log[(a + b*x)/(c + d*x)] + 4*b^3*c^2*d*x*Log[(a + b*x)/(c +
d*x)] + 6*a*b^2*c*d^2*x*Log[(a + b*x)/(c + d*x)] - 10*a^2*b*d^3*x*Log[(a +
b*x)/(c + d*x)] - 2*b^3*c*d^2*x^2*Log[(a + b*x)/(c + d*x)] + 2*a*b^2*d^3*x^
2*Log[(a + b*x)/(c + d*x)] + 11*a^3*d^3*Log[(a + b*x)/(c + d*x)]^2 + 6*a^2*
b*d^3*x*Log[(a + b*x)/(c + d*x)]^2 - 3*a*b^2*d^3*x^2*Log[(a + b*x)/(c + d*x
)]^2 + 2*b^3*d^3*x^3*Log[(a + b*x)/(c + d*x)]^2 - 2*a^3*d^3*Log[(a + b*x)/(
c + d*x)]^3 + 4*b^3*c^3*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d
*x)] + 6*a*b^2*c^2*d*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)
] + 12*a^2*b*c*d^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)]
- 22*a^3*d^3*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*a^
3*d^3*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*(2*b^3*
c^3 + 3*a*b^2*c^2*d + 6*a^2*b*c*d^2 - 11*a^3*d^3 + 6*a^3*d^3*Log[(a + b*x)/
(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 12*a^3*d^3*PolyLog[3,
 (d*(a + b*x))/(b*(c + d*x))]) - 6*b^3*B^2*c^3*n^2*(Log[(-(b*c) + a*d)/(d*(
a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - 2*Log[(a + b*x)/(c + d*x)]*PolyLog[
2, (b*(c + d*x))/(d*(a + b*x))] - 2*PolyLog[3, ...
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{\left(dix+ci\right)^{3} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="maxima")
```

```
[Out] -3*I*A^2*c^2*d*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + 1/6*I*A^2*d^3*(6*a^3*lo
g(b*x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) - 3/2*I*A^2
*c*d^2*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) - I*A^2*c^3*l
og(b*g*x + a*g)/(b*g) + 1/6*(-2*I*B^2*b^3*d^3*x^3 - 3*(3*I*b^3*c*d^2 - I*a*
b^2*d^3)*B^2*x^2 - 6*(3*I*b^3*c^2*d - 3*I*a*b^2*c*d^2 + I*a^2*b*d^3)*B^2*x
- 6*(I*b^3*c^3 - 3*I*a*b^2*c^2*d + 3*I*a^2*b*c*d^2 - I*a^3*d^3)*B^2*log(b*x
 + a))*log((d*x + c)^n)^2/(b^4*g) + integrate(1/3*(-6*I*A*B*b^4*c^4 - 3*I*B
^2*b^4*c^4 - 3*(2*I*A*B*b^4*d^4 + I*B^2*b^4*d^4)*x^4 - 12*(2*I*A*B*b^4*c*d^
3 + I*B^2*b^4*c*d^3)*x^3 - 18*(2*I*A*B*b^4*c^2*d^2 + I*B^2*b^4*c^2*d^2)*x^2
 - 3*(I*B^2*b^4*d^4*x^4 + 4*I*B^2*b^4*c*d^3*x^3 + 6*I*B^2*b^4*c^2*d^2*x^2 +
 4*I*B^2*b^4*c^3*d*x + I*B^2*b^4*c^4)*log((b*x + a)^n)^2 - 12*(2*I*A*B*b^4*
c^3*d + I*B^2*b^4*c^3*d)*x - 6*(I*A*B*b^4*c^4 + I*B^2*b^4*c^4 + (I*A*B*b^4*
d^4 + I*B^2*b^4*d^4)*x^4 + 4*(I*A*B*b^4*c*d^3 + I*B^2*b^4*c*d^3)*x^3 + 6*(I
*A*B*b^4*c^2*d^2 + I*B^2*b^4*c^2*d^2)*x^2 + 4*(I*A*B*b^4*c^3*d + I*B^2*b^4*
c^3*d)*x)*log((b*x + a)^n) + (6*I*A*B*b^4*c^4 + 6*I*B^2*b^4*c^4 - 2*(B^2*b^
4*d^4*(-I*n - 3*I) - 3*I*A*B*b^4*d^4)*x^4 + (24*I*A*B*b^4*c*d^3 + (-I*a*b^3
*d^4*n - 3*b^4*c*d^3*(-3*I*n - 8*I))*B^2)*x^3 - 3*(-12*I*A*B*b^4*c^2*d^2 +
(3*I*a*b^3*c*d^3*n - I*a^2*b^2*d^4*n + 6*b^4*c^2*d^2*(-I*n - 2*I))*B^2)*x^2
 - 6*(-4*I*A*B*b^4*c^3*d + (-3*I*a*b^3*c^2*d^2*n + 3*I*a^2*b^2*c*d^3*n - I*
a^3*b*d^4*n - 4*I*b^4*c^3*d)*B^2)*x - 6*((-I*b^4*c^3*d*n + 3*I*a*b^3*c^2*d^
2*n - 3*I*a^2*b^2*c*d^3*n + I*a^3*b*d^4*n)*B^2*x + (-I*a*b^3*c^3*d*n + 3*I*
a^2*b^2*c^2*d^2*n - 3*I*a^3*b*c*d^3*n + I*a^4*d^4*n)*B^2)*log(b*x + a) - 6*
(-I*B^2*b^4*d^4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4*c^2*d^2*x^2 - 4*I
*B^2*b^4*c^3*d*x - I*B^2*b^4*c^4)*log((b*x + a)^n))*log((d*x + c)^n))/(b^5*
d*g*x^2 + a*b^4*c*g + (b^5*c*g + a*b^4*d*g)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="fricas")
```

```
[Out] integral(((-I*A^2 - 2*I*A*B - I*B^2)*d^3*x^3 - 3*(I*A^2 + 2*I*A*B + I*B^2)*
c*d^2*x^2 - 3*(I*A^2 + 2*I*A*B + I*B^2)*c^2*d*x + (-I*A^2 - 2*I*A*B - I*B^2
```

```
)*c^3 + (-I*B^2*d^3*n^2*x^3 - 3*I*B^2*c*d^2*n^2*x^2 - 3*I*B^2*c^2*d*n^2*x -
 I*B^2*c^3*n^2)*log((b*x + a)/(d*x + c))^2 - 2*((I*A*B + I*B^2)*d^3*n*x^3 +
 3*(I*A*B + I*B^2)*c*d^2*n*x^2 + 3*(I*A*B + I*B^2)*c^2*d*n*x + (I*A*B + I*B
^2)*c^3*n)*log((b*x + a)/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [F]

time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^3\left(\int \frac{A^2c^3}{a+bx}\,dx + \int \frac{A^2d^3x^3}{a+bx}\,dx + \int \frac{B^2c^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a+bx}\,dx + \int \frac{2ABc^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx + \int \frac{3A^2cd^2x^2}{a+bx}\,dx + \int \frac{3A^2c^2dx}{a+bx}\,dx + \int \frac{B^2d^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a+bx}\,dx + \int \frac{2ABd^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx + \int \frac{3B^2cd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a+bx}\,dx + \int \frac{3B^2c^2dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a+bx}\,dx + \int \frac{6ABcd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx + \int \frac{6ABc^2dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a+bx}\,dx\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g),x)
```

```
[Out] i**3*(Integral(A**2*c**3/(a + b*x), x) + Integral(A**2*d**3*x**3/(a + b*x),
 x) + Integral(B**2*c**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a + b*
x), x) + Integral(2*A*B*c**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b
*x), x) + Integral(3*A**2*c*d**2*x**2/(a + b*x), x) + Integral(3*A**2*c**2*
d*x/(a + b*x), x) + Integral(B**2*d**3*x**3*log(e*(a/(c + d*x) + b*x/(c + d
*x))**n)**2/(a + b*x), x) + Integral(2*A*B*d**3*x**3*log(e*(a/(c + d*x) + b
*x/(c + d*x))**n)/(a + b*x), x) + Integral(3*B**2*c*d**2*x**2*log(e*(a/(c +
 d*x) + b*x/(c + d*x))**n)**2/(a + b*x), x) + Integral(3*B**2*c**2*d*x*log(
e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a + b*x), x) + Integral(6*A*B*c*d**
2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x) + Integral(6*A
*B*c**2*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a + b*x), x))/g
```

Giac [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(b*g*x +
 a*g), x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
),x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
), x)
```

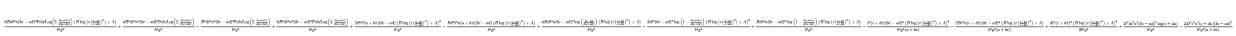
3.183 $\int \frac{(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2} dx$

Optimal. Leaf size=739

$$-\frac{2B^2(bc-ad)^2i^3n^2(c+dx)}{b^3g^2(a+bx)}-\frac{Bd^2(bc-ad)i^3n(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^4g^2}-\frac{2B(bc-ad)^2i^3n(c+dx)}{b^3g^2(a}$$

```
[Out] -2*B^2*(-a*d+b*c)^2*i^3*n^2*(d*x+c)/b^3/g^2/(b*x+a)-B*d^2*(-a*d+b*c)*i^3*n*
(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/g^2-2*B*(-a*d+b*c)^2*i^3*n*(d*x
+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/g^2/(b*x+a)+2*d^2*(-a*d+b*c)*i^3*(b
*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^4/g^2-(-a*d+b*c)^2*i^3*(d*x+c)*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^3/g^2/(b*x+a)+1/2*d*i^3*(d*x+c)^2*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))^2/b^2/g^2+4*B*d*(-a*d+b*c)^2*i^3*n*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/b^4/g^2+B^2*d*(-a*d+b*c)^2*i^3*n^
2*ln(d*x+c)/b^4/g^2+B*d*(-a*d+b*c)^2*i^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*
ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g^2-3*d*(-a*d+b*c)^2*i^3*(A+B*ln(e*((b*x+a)/(
d*x+c))^n))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g^2+4*B^2*d*(-a*d+b*c)^2*i^3*n^
2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/g^2-B^2*d*(-a*d+b*c)^2*i^3*n^2*polylog
(2,b*(d*x+c)/d/(b*x+a))/b^4/g^2+6*B*d*(-a*d+b*c)^2*i^3*n*(A+B*ln(e*((b*x+a)
/(d*x+c))^n))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g^2+6*B^2*d*(-a*d+b*c)^2*i
^3*n^2*polylog(3,b*(d*x+c)/d/(b*x+a))/b^4/g^2
```

Rubi [A]
time = 0.54, antiderivative size = 739, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 14, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.311$, Rules used = {2561, 2395, 2342, 2341, 2356, 2389, 2379, 2438, 2351, 31, 2355, 2354, 2421, 6724}



Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*i^3*n^2*(c + d*x))/(b^3*g^2*(a + b*x)) - (B*d^2*(b*c
- a*d)*i^3*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) -
(2*B*(b*c - a*d)^2*i^3*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(b^3*g^2*(a + b*x)) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])^2)/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2*(a + b*x)) + (d*i^3*(c + d*x)^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^2) + (4*B*d*(b*c - a*d)^2*i^
3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/
(b^4*g^2) + (B^2*d*(b*c - a*d)^2*i^3*n^2*Log[c + d*x])/(b^4*g^2) + (B*d*(b*
```

```
c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x
))/(d*(a + b*x))])/(b^4*g^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (4*B^
2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g^2
) - (B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(
b^4*g^2) + (6*B*d*(b*c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (6*B^2*d*(b*c - a*d)
^2*i^3*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(183c+183dx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{6128487d^2(3bc-2ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \right.$$

$$= \frac{(6128487d^3)\int x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{b^2g^2} + \frac{(6128487}{}$$

$$= \frac{6128487d^2(3bc-2ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \frac{6128}{}$$

$$= \frac{6128487d^2(3bc-2ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \frac{6128}{}$$

$$= \frac{6128487d^2(3bc-2ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \frac{6128}{}$$

$$= \frac{6128487d^2(3bc-2ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \frac{6128}{}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{12256974B(bc-ad)^3n(A}{b^4g^2(a+}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{6128487B^2d^2(bc-ad)n(}{b^4g}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{6128487B^2d^2(bc-ad)n(}{b^4g}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{12256974B^2(bc-ad)^3n^2}{b^4g^2(a+bx)}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{12256974B^2(bc-ad)^3n^2}{b^4g^2(a+bx)}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{12256974B^2(bc-ad)^3n^2}{b^4g^2(a+bx)}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 4150 vs. 2(739) = 1478.

time = 16.52, size = 4150, normalized size = 5.62

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^2,x]
```

```
[Out] (i^3*(2*b*d^2*(3*b*c - 2*a*d)*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n
*Log[(a + b*x)/(c + d*x)])^2 + b^2*d^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x
))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 - (2*(b*c - a*d)^3*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2)/(a + b*x) + 6*d*(b
*c - a*d)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a
 + b*x)/(c + d*x)])^2 + (4*b^3*B*c^3*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^
n] + B*n*Log[(a + b*x)/(c + d*x)])*(-(d*(a + b*x)*Log[c/d + x]) + d*(a + b*
x)*Log[(d*(a + b*x))/(-(b*c) + a*d)] + (b*c - a*d)*(1 + Log[(a + b*x)/(c +
d*x)])))/((b*c - a*d)*(a + b*x)) + (2*b^3*B^2*c^3*n^2*(-2*b*c + 2*a*d - 2*d
*(a + b*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*d*(a +
 b*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - (b*c - a*d)*Log[(a + b*x)/(c
+ d*x)]^2 + 2*d*(a + b*x)*Log[c + d*x] - 2*d*(a + b*x)*Log[(a + b*x)/(c + d
*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + d*(a + b*x)*(Log[a + b*x]*(Log[a + b*
x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c)
 + a*d)]) + d*(a + b*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x)
)/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c +
d*x))/(b*c - a*d)])))/((b*c - a*d)*(a + b*x)) + 6*b^2*B*c^2*d*n*(A + B*Log[
e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[a/b + x]^2
- 2*Log[a/b + x]*Log[a + b*x] - 2*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) +
a*d)] + 2*Log[a + b*x]*((a*d)/(b*c - a*d) + Log[c/d + x] + Log[(a + b*x)/(c
 + d*x)]) + 2*a*((a + b*x)^(-1) + Log[(a + b*x)/(c + d*x)]/(a + b*x) + (d*L
og[c + d*x])/(-(b*c) + a*d)) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2
*B*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x
)])*(4*a^2 - (4*a*b*c)/d + a*b*x - (b^2*c*x)/d + (2*a^3)/(a + b*x) + 3*a^2*
Log[a/b + x]^2 + (4*a*b*c*Log[c/d + x])/d - a^2*Log[a + b*x] + (2*a^3*d*Log
[a + b*x])/(b*c - a*d) + 6*a^2*Log[c/d + x]*Log[a + b*x] - 2*a^2*Log[a/b +
x]*(2 + 3*Log[a + b*x]) - 6*a^2*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*
d)] - 4*a*b*x*Log[(a + b*x)/(c + d*x)] + b^2*x^2*Log[(a + b*x)/(c + d*x)] +
 (2*a^3*Log[(a + b*x)/(c + d*x)])/(a + b*x) + 6*a^2*Log[a + b*x]*Log[(a + b
*x)/(c + d*x)] + (b^2*c^2*Log[c + d*x])/d^2 + (2*a^3*d*Log[c + d*x])/(-(b*c
) + a*d) - 6*a^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 12*b*B*c*d^2*n*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*((a + b
*x)*(-1 + Log[a/b + x]) - a*Log[a/b + x]^2 - (a^2*(1 + Log[a/b + x]))/(a +
b*x) - b*(c/d + x)*(-1 + Log[c/d + x]) + (a^2*Log[c/d + x])/(a + b*x) + (b*
x - a^2/(a + b*x) - 2*a*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(
a + b*x)/(c + d*x)]) + (a^2*d*(Log[a + b*x] - Log[c + d*x]))/(-(b*c) + a*d)
 + 2*a*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c +
```

```
 d*x))/(b*c - a*d)])) + (B^2*d^3*n^2*((-2*b^2*c^2*(b*c - a*d)*Log[(b*c - a*
d)/(c + d*x)])/d^2 + 2*a^2*(-(b*c) + a*d)*Log[(b*c - a*d)/(c + d*x)] - (4*a
*b*c*(-(b*c) + a*d)*Log[(b*c - a*d)/(c + d*x)])/d + (b^3*c^3*Log[(a + b*x)/
(c + d*x)]^2)/d^2 - (a*b^2*c^2*Log[(a + b*x)/(c + d*x)]^2)/d - ((b*c - a*d)
^2*(b*c + 5*a*d)*Log[(a + b*x)/(c + d*x)]^2)/d^2 + (b*c - a*d)*(a + b*x)^2*
Log[(a + b*x)/(c + d*x)]^2 + 2*a^2*b*c*Log[(a + b*x)/(c + d*x)]^3 - 2*a^3*d
*Log[(a + b*x)/(c + d*x)]^3 + (2*(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)/(c
+ d*x)]*(b*c - a*d + 3*a*d*Log[(a + b*x)/(c + d*x)]))/d + (2*a^3*b*(c + d*x
)*(2 + 2*Log[(a + b*x)/(c + d*x)] + Log[(a + b*x)/(c + d*x)]^2))/(a + b*x)
- 9*a^2*b*c*(Log[(a + b*x)/(c + d*x)]*(Log[(a + b*x)/(c + d*x)] - 2*Log[(b*
c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]) + (4*
a*b^2*c^2*(Log[(a + b*x)/(c + d*x)]*(Log[(a + b*x)/(c + d*x)] - 2*Log[(b*c
- a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]))/d + 5*
a^3*d*(Log[(a + b*x)/(c + d*x)]*(Log[(a + b*x)/(c + d*x)] - 2*Log[(b*c - a*
d)/(b*c + b*d*x)]) - 2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]) - (b^2*c^2*
(b*c - a*d)*(Log[(a + b*x)/(c + d*x)]*(2*Log[(-(b*c) + a*d)/(d*(a + b*x))]
+ Log[(a + b*x)/(c + d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))]))/d
^2 + 2*a^2*(-(b*c) + a*d)*(Log[(a + b*x)/(c + d*x)]^2*(3*Log[(-(b*c) + a*d)
/(d*(a + b*x))] + Log[(a + b*x)/(c + d*x)]) - 6*Log[(a + b*x)/(c + d*x)]*Po
lyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 6*PolyLog[3, (b*(c + d*x))/(d*(a +
b*x))])))/(b*c - a*d) + (2*b^2*B^2*c^2*d*n^2*(6*b*c - 6*a*d - (6*b^2*c*x)/(
a + b*x) + (6*a*b*d*x)/(a + b*x) + 6*a*d*Log[a/b + x] + 3*b*c*Log[a/b + x]^
2 - 3*a*d*Log[a/b + x]^2 - 6*b*c*Log[c/d + x] + 6*b*c*Log[a + b*x] - 6*a*d*
Log[a + b*x] - 6*b*c*Log[a/b + x]*Log[a + b*x] + 6*a*d*Log[a/b + x]*Log[a +
 b*x] + 6*b*c*Log[c/d + x]*Log[a + b*x] - 6*a*d*Log[c/d + x]*Log[a + b*x] -
 6*b*c*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 6*a*d*Log[c/d + x]*
Log[(d*(a + b*x))/(-(b*c) + a*d)] - (6*b*(b*c - a*d)*x*Log[(a + b*x)/(c + d
*x)])/(a + b*x) + 6*b*c*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 6*a*d*Log[a
 + b*x]*Log[(a + b*x)/(c + d*x)] + 3*a*d*Log[(a + b*x)/(c + d*x)]^2 + 3*b*d
*x*Log[(a + b*x)/(c + d*x)]^2 - (3*b^2*x*(c + d...
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="maxima")
```

```
[Out] 2*I*A*B*c^3*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^
2) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + 3*I*A^2*(a^2/(b^4*g^2*x + a*b^
3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*c*d^2 - 1/2*I*(2*a^3/(b^
5*g^2*x + a*b^4*g^2) + 6*a^2*log(b*x + a)/(b^4*g^2) + (b*x^2 - 4*a*x)/(b^3*
g^2))*A^2*d^3 - 3*I*A^2*c^2*d*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^
2*g^2)) + 2*I*A*B*c^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^2*g^2*x + a
*b*g^2) + I*A^2*c^3/(b^2*g^2*x + a*b*g^2) - 1/2*(I*B^2*b^3*d^3*x^3 - 3*(-2*
I*b^3*c*d^2 + I*a*b^2*d^3)*B^2*x^2 - 2*(-3*I*a*b^2*c*d^2 + 2*I*a^2*b*d^3)*B
^2*x - 2*(I*b^3*c^3 - 3*I*a*b^2*c^2*d + 3*I*a^2*b*c*d^2 - I*a^3*d^3)*B^2 -
6*((-I*b^3*c^2*d + 2*I*a*b^2*c*d^2 - I*a^2*b*d^3)*B^2*x + (-I*a*b^2*c^2*d +
 2*I*a^2*b*c*d^2 - I*a^3*d^3)*B^2)*log(b*x + a))*log((d*x + c)^n)^2/(b^5*g^
2*x + a*b^4*g^2) + integrate((-I*B^2*b^4*c^4 + (-2*I*A*B*b^4*d^4 - I*B^2*b^
4*d^4)*x^4 - 4*(2*I*A*B*b^4*c*d^3 + I*B^2*b^4*c*d^3)*x^3 - 6*(2*I*A*B*b^4*c
^2*d^2 + I*B^2*b^4*c^2*d^2)*x^2 + (-I*B^2*b^4*d^4*x^4 - 4*I*B^2*b^4*c*d^3*x
^3 - 6*I*B^2*b^4*c^2*d^2*x^2 - 4*I*B^2*b^4*c^3*d*x - I*B^2*b^4*c^4)*log((b*
x + a)^n)^2 - 2*(3*I*A*B*b^4*c^3*d + 2*I*B^2*b^4*c^3*d)*x - 2*(I*B^2*b^4*c^
4 + (I*A*B*b^4*d^4 + I*B^2*b^4*d^4)*x^4 + 4*(I*A*B*b^4*c*d^3 + I*B^2*b^4*c*
d^3)*x^3 + 6*(I*A*B*b^4*c^2*d^2 + I*B^2*b^4*c^2*d^2)*x^2 + (3*I*A*B*b^4*c^3
*d + 4*I*B^2*b^4*c^3*d)*x)*log((b*x + a)^n) + ((B^2*b^4*d^4*(I*n + 2*I) + 2
*I*A*B*b^4*d^4)*x^4 - 2*(-4*I*A*B*b^4*c*d^3 + (I*a*b^3*d^4*n + b^4*c*d^3*(-
3*I*n - 4*I))*B^2)*x^3 - 2*(I*a*b^3*c^3*d*n - 3*I*a^2*b^2*c^2*d^2*n + 3*I*a
^3*b*c*d^3*n - I*a^4*d^4*n - I*b^4*c^4)*B^2 + (12*I*A*B*b^4*c^2*d^2 + (12*I
*a*b^3*c*d^3*n - 7*I*a^2*b^2*d^4*n + 12*I*b^4*c^2*d^2)*B^2)*x^2 - 2*(-3*I*A
*B*b^4*c^3*d + (-3*I*a*b^3*c^2*d^2*n + I*a^3*b*d^4*n + b^4*c^3*d*(I*n - 4*I
))*B^2)*x - 6*((-I*b^4*c^2*d^2*n + 2*I*a*b^3*c*d^3*n - I*a^2*b^2*d^4*n)*B^2
*x^2 + 2*(-I*a*b^3*c^2*d^2*n + 2*I*a^2*b^2*c*d^3*n - I*a^3*b*d^4*n)*B^2*x +
 (-I*a^2*b^2*c^2*d^2*n + 2*I*a^3*b*c*d^3*n - I*a^4*d^4*n)*B^2)*log(b*x + a)
 - 2*(-I*B^2*b^4*d^4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4*c^2*d^2*x^2
- 4*I*B^2*b^4*c^3*d*x - I*B^2*b^4*c^4)*log((b*x + a)^n))*log((d*x + c)^n))/
(b^6*d*g^2*x^3 + a^2*b^4*c*g^2 + (b^6*c*g^2 + 2*a*b^5*d*g^2)*x^2 + (2*a*b^5
*c*g^2 + a^2*b^4*d*g^2)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="fricas")
```

```
[Out] integral(((-I*A^2 - 2*I*A*B - I*B^2)*d^3*x^3 - 3*(I*A^2 + 2*I*A*B + I*B^2)*
c*d^2*x^2 - 3*(I*A^2 + 2*I*A*B + I*B^2)*c^2*d*x + (-I*A^2 - 2*I*A*B - I*B^2
)*c^3 + (-I*B^2*d^3*n^2*x^3 - 3*I*B^2*c*d^2*n^2*x^2 - 3*I*B^2*c^2*d*n^2*x -
 I*B^2*c^3*n^2)*log((b*x + a)/(d*x + c))^2 - 2*((I*A*B + I*B^2)*d^3*n*x^3 +
 3*(I*A*B + I*B^2)*c*d^2*n*x^2 + 3*(I*A*B + I*B^2)*c^2*d*n*x + (I*A*B + I*B
^2)*c^3*n)*log((b*x + a)/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2),
 x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2
,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="giac")
```

```
[Out] integrate((I*d*x + I*c)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(b*g*x +
 a*g)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{{\left(a\,g+b\,g\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^2,x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^2, x)
```

3.184 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=644

$$-\frac{4B^2d(bc-ad)i^3n^2(c+dx)}{b^3g^3(a+bx)}-\frac{B^2(bc-ad)i^3n^2(c+dx)^2}{4b^2g^3(a+bx)^2}-\frac{4Bd(bc-ad)i^3n(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^3(a+bx)}$$

```
[Out] -4*B^2*d*(-a*d+b*c)*i^3*n^2*(d*x+c)/b^3/g^3/(b*x+a)-1/4*B^2*(-a*d+b*c)*i^3*
n^2*(d*x+c)^2/b^2/g^3/(b*x+a)^2-4*B*d*(-a*d+b*c)*i^3*n*(d*x+c)*(A+B*ln(e*((
b*x+a)/(d*x+c))^n))/b^3/g^3/(b*x+a)-1/2*B*(-a*d+b*c)*i^3*n*(d*x+c)^2*(A+B*l
n(e*((b*x+a)/(d*x+c))^n))/b^2/g^3/(b*x+a)^2+d^3*i^3*(b*x+a)*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))^2/b^4/g^3-2*d*(-a*d+b*c)*i^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d
*x+c))^n))^2/b^3/g^3/(b*x+a)-1/2*(-a*d+b*c)*i^3*(d*x+c)^2*(A+B*ln(e*((b*x+a
)/(d*x+c))^n))^2/b^2/g^3/(b*x+a)^2+2*B*d^2*(-a*d+b*c)*i^3*n*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/b^4/g^3-3*d^2*(-a*d+b*c)*i^3*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b^4/g^3+2*B^2*d^2*(
-a*d+b*c)*i^3*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/g^3+6*B*d^2*(-a*d+b*c)
*i^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g
^3+6*B^2*d^2*(-a*d+b*c)*i^3*n^2*polylog(3,b*(d*x+c)/d/(b*x+a))/b^4/g^3
```

Rubi [A]

time = 0.45, antiderivative size = 644, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2561, 2395, 2342, 2341, 2355, 2354, 2438, 2379, 2421, 6724}

$$\frac{6Bd^2i^3n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^3}+\frac{2B^2d^2i^3n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^3}+\frac{6B^2d^2i^3n^2(bc-ad)\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^3}+\frac{d^3i^3(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^4g^3}+\frac{2Bd^2i^3n(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^3}-\frac{3d^2i^3(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^4g^3}-\frac{2di^3(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^3g^3(a+bx)}-\frac{4Bdi^3n(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^3(a+bx)}-\frac{i^3(c+dx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2b^2g^3(a+bx)^2}-\frac{Bi^3n(c+dx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g^3(a+bx)^2}-\frac{4B^2di^3n^2(c+dx)(bc-ad)}{b^3g^3(a+bx)}-\frac{B^2i^3n^2(c+dx)^2(bc-ad)}{4b^2g^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^3,x]
```

```
[Out] (-4*B^2*d*(b*c - a*d)*i^3*n^2*(c + d*x))/(b^3*g^3*(a + b*x)) - (B^2*(b*c -
a*d)*i^3*n^2*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) - (4*B*d*(b*c - a*d)*i^3*
n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^3*(a + b*x)) - (
B*(b*c - a*d)*i^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*
b^2*g^3*(a + b*x)^2) + (d^3*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2)/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2)/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*(c + d*x)^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^3*(a + b*x)^2) + (2*B*d^2*(b*
c - a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c
 + d*x))])/(b^4*g^3) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3) + (2*B^2*d^2*(b
*c - a*d)*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g^3) + (6*B
```

```
*d^2*(b*c - a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b
*(c + d*x))/(d*(a + b*x))])/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*n^2*Poly
Log[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(184c+184dx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx = \int \left(\frac{6229504d^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} + \frac{6229504(bc-\right.$$

$$= \frac{(6229504d^3)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{b^3g^3} + \frac{(18688512}{}$$

$$= \frac{6229504d^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} - \frac{3114752(bc-ad}{b^4}$$

$$= \frac{6229504d^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} - \frac{3114752(bc-ad}{b^4}$$

$$= \frac{6229504d^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} - \frac{3114752(bc-ad}{b^4}$$

$$= \frac{6229504d^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} - \frac{3114752(bc-ad}{b^4}$$

$$= -\frac{3114752B(bc-ad)^3n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^4g^3(a+bx)^2} - \frac{31147}{}$$

$$= -\frac{18688512B^2d^2(bc-ad)\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^3} -$$

$$= -\frac{18688512B^2d^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^3}$$

$$= -\frac{1557376B^2(bc-ad)^3n^2}{b^4g^3(a+bx)^2} - \frac{28032768B^2d(bc-ad)^2n^2}{b^4g^3(a+bx)}$$

$$= -\frac{1557376B^2(bc-ad)^3n^2}{b^4g^3(a+bx)^2} - \frac{28032768B^2d(bc-ad)^2n^2}{b^4g^3(a+bx)}$$

$$= -\frac{1557376B^2(bc-ad)^3n^2}{b^4g^3(a+bx)^2} - \frac{28032768B^2d(bc-ad)^2n^2}{b^4g^3(a+bx)}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 6226 vs. $2(644) = 1288$.

time = 21.17, size = 6226, normalized size = 9.67

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^3,x]
```

```
[Out] Result too large to show
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(dix + ci)^3 \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx + ag)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="maxima")
```

```
[Out] 3/2*I*A*B*c^2*d*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^
4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3)
 + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*
g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d
^2)*g^3)) - 1/2*I*A*B*c^3*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3
*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*l
og(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/
((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) + 1/2*I*A^2*d^3*((6*a^2*b*x + 5*
a^3)/(b^6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*log(
b*x + a)/(b^4*g^3)) - 3/2*I*A^2*c*d^2*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a
*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) + 3*I*(2*b*x + a)*A*B
*c^2*d*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^4*g^3*x^2 + 2*a*b^3*g^3*x
+ a^2*b^2*g^3) + 3/2*I*(2*b*x + a)*A^2*c^2*d/(b^4*g^3*x^2 + 2*a*b^3*g^3*x +
 a^2*b^2*g^3) + I*A*B*c^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^3*g^3*x
^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 1/2*I*A^2*c^3/(b^3*g^3*x^2 + 2*a*b^2*g^3*
```

```
x + a^2*b*g^3) + 1/2*(-2*I*B^2*b^3*d^3*x^3 - 4*I*B^2*a*b^2*d^3*x^2 - 2*(-3*
I*b^3*c^2*d + 6*I*a*b^2*c*d^2 - 2*I*a^2*b*d^3)*B^2*x + (I*b^3*c^3 + 3*I*a*b
^2*c^2*d - 9*I*a^2*b*c*d^2 + 5*I*a^3*d^3)*B^2 - 6*((I*b^3*c*d^2 - I*a*b^2*d
^3)*B^2*x^2 + 2*(I*a*b^2*c*d^2 - I*a^2*b*d^3)*B^2*x + (I*a^2*b*c*d^2 - I*a^
3*d^3)*B^2)*log(b*x + a))*log((d*x + c)^n)^2/(b^6*g^3*x^2 + 2*a*b^5*g^3*x +
 a^2*b^4*g^3) + integrate((-4*I*B^2*b^4*c^3*d*x - I*B^2*b^4*c^4 + (-2*I*A*B
*b^4*d^4 - I*B^2*b^4*d^4)*x^4 - 4*(2*I*A*B*b^4*c*d^3 + I*B^2*b^4*c*d^3)*x^3
 - 6*(I*A*B*b^4*c^2*d^2 + I*B^2*b^4*c^2*d^2)*x^2 + (-I*B^2*b^4*d^4*x^4 - 4*
I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4*c^2*d^2*x^2 - 4*I*B^2*b^4*c^3*d*x - I*B^2
*b^4*c^4)*log((b*x + a)^n)^2 - 2*(4*I*B^2*b^4*c^3*d*x + I*B^2*b^4*c^4 + (I*
A*B*b^4*d^4 + I*B^2*b^4*d^4)*x^4 + 4*(I*A*B*b^4*c*d^3 + I*B^2*b^4*c*d^3)*x^
3 + 3*(I*A*B*b^4*c^2*d^2 + 2*I*B^2*b^4*c^2*d^2)*x^2)*log((b*x + a)^n) - (2*
(B^2*b^4*d^4*(-I*n - I) - I*A*B*b^4*d^4)*x^4 - (-9*I*a*b^3*c^2*d^2*n + 21*I
*a^2*b^2*c*d^3*n - 9*I*a^3*b*d^4*n + b^4*c^3*d*(-I*n + 8*I))*B^2*x + 2*(-4*
I*A*B*b^4*c*d^3 + (-3*I*a*b^3*d^4*n - 4*I*b^4*c*d^3)*B^2)*x^3 - (-I*a*b^3*c
^3*d*n - 3*I*a^2*b^2*c^2*d^2*n + 9*I*a^3*b*c*d^3*n - 5*I*a^4*d^4*n + 2*I*b^
4*c^4)*B^2 + 6*(-I*A*B*b^4*c^2*d^2 + (-2*I*a*b^3*c*d^3*n + b^4*c^2*d^2*(I*n
 - 2*I))*B^2)*x^2 + 6*((-I*b^4*c*d^3*n + I*a*b^3*d^4*n)*B^2*x^3 + 3*(-I*a*b
^3*c*d^3*n + I*a^2*b^2*d^4*n)*B^2*x^2 + 3*(-I*a^2*b^2*c*d^3*n + I*a^3*b*d^4
*n)*B^2*x + (-I*a^3*b*c*d^3*n + I*a^4*d^4*n)*B^2)*log(b*x + a) + 2*(-I*B^2*
b^4*d^4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4*c^2*d^2*x^2 - 4*I*B^2*b^4
*c^3*d*x - I*B^2*b^4*c^4)*log((b*x + a)^n))*log((d*x + c)^n))/(b^7*d*g^3*x^
4 + a^3*b^4*c*g^3 + (b^7*c*g^3 + 3*a*b^6*d*g^3)*x^3 + 3*(a*b^6*c*g^3 + a^2*
b^5*d*g^3)*x^2 + (3*a^2*b^5*c*g^3 + a^3*b^4*d*g^3)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="fricas")
```

```
[Out] integral(((-I*A^2 - 2*I*A*B - I*B^2)*d^3*x^3 - 3*(I*A^2 + 2*I*A*B + I*B^2)*
c*d^2*x^2 - 3*(I*A^2 + 2*I*A*B + I*B^2)*c^2*d*x + (-I*A^2 - 2*I*A*B - I*B^2
)*c^3 + (-I*B^2*d^3*n^2*x^3 - 3*I*B^2*c*d^2*n^2*x^2 - 3*I*B^2*c^2*d*n^2*x -
 I*B^2*c^3*n^2)*log((b*x + a)/(d*x + c))^2 - 2*((I*A*B + I*B^2)*d^3*n*x^3 +
 3*(I*A*B + I*B^2)*c*d^2*n*x^2 + 3*(I*A*B + I*B^2)*c^2*d*n*x + (I*A*B + I*B
^2)*c^3*n)*log((b*x + a)/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2
*b*g^3*x + a^3*g^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3
,x)
```

```
[Out] Timed out
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(c\,i+d\,i\,x\right)^3\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2}{\left(a\,g+b\,g\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^3,x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^3, x)
```

3.185 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=561

$$-\frac{2B^2d^2i^3n^2(c+dx)}{b^3g^4(a+bx)}-\frac{B^2di^3n^2(c+dx)^2}{4b^2g^4(a+bx)^2}-\frac{2B^2i^3n^2(c+dx)^3}{27bg^4(a+bx)^3}-\frac{2Bd^2i^3n(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^4(a+bx)}-\frac{B}{}$$

```
[Out] -2*B^2*d^2*i^3*n^2*(d*x+c)/b^3/g^4/(b*x+a)-1/4*B^2*d*i^3*n^2*(d*x+c)^2/b^2/
g^4/(b*x+a)^2-2/27*B^2*i^3*n^2*(d*x+c)^3/b/g^4/(b*x+a)^3-2*B*d^2*i^3*n*(d*x
+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/g^4/(b*x+a)-1/2*B*d*i^3*n*(d*x+c)^2
*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/g^4/(b*x+a)^2-2/9*B*i^3*n*(d*x+c)^3*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))/b/g^4/(b*x+a)^3-d^2*i^3*(d*x+c)*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))^2/b^3/g^4/(b*x+a)-1/2*d*i^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)
/(d*x+c))^n))^2/b^2/g^4/(b*x+a)^2-1/3*i^3*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x
+c))^n))^2/b/g^4/(b*x+a)^3-d^3*i^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln(1-b
*(d*x+c)/d/(b*x+a))/b^4/g^4+2*B*d^3*i^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*p
olylog(2,b*(d*x+c)/d/(b*x+a))/b^4/g^4+2*B^2*d^3*i^3*n^2*polylog(3,b*(d*x+c)
/d/(b*x+a))/b^4/g^4
```

Rubi [A]
time = 0.50, antiderivative size = 561, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.156$, Rules used = {2561, 2380, 2342, 2341, 2379, 2421, 6724}

$$\frac{2Bd^3i^3n\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^4}+\frac{2B^2d^3i^3n^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^4}-\frac{d^3i^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^4g^4}-\frac{d^2i^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b^3g^4(a+bx)}-\frac{2Bd^2i^3n(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^4(a+bx)}-\frac{di^3(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2b^2g^4(a+bx)^2}-\frac{Bdi^3n(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g^4(a+bx)^2}-\frac{i^3(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3bg^4(a+bx)^3}-\frac{2Bi^3n(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9bg^4(a+bx)^3}-\frac{2B^2d^2i^3n^2(c+dx)}{b^3g^4(a+bx)}-\frac{B^2di^3n^2(c+dx)^2}{4b^2g^4(a+bx)^2}-\frac{2B^2i^3n^2(c+dx)^3}{27bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^4,x]
```

```
[Out] (-2*B^2*d^2*i^3*n^2*(c + d*x))/(b^3*g^4*(a + b*x)) - (B^2*d*i^3*n^2*(c + d*
x)^2)/(4*b^2*g^4*(a + b*x)^2) - (2*B^2*i^3*n^2*(c + d*x)^3)/(27*b*g^4*(a +
b*x)^3) - (2*B*d^2*i^3*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(b^3*g^4*(a + b*x)) - (B*d*i^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(2*b^2*g^4*(a + b*x)^2) - (2*B*i^3*n*(c + d*x)^3*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(9*b*g^4*(a + b*x)^3) - (d^2*i^3*(c + d*x)*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^4*(a + b*x)) - (d*i^3*(c + d*x)^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^4*(a + b*x)^2) - (i^3*(c
 + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b*g^4*(a + b*x)^3) -
 (d^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d
*(a + b*x))])/(b^4*g^4) + (2*B*d^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^4) + (2*B^2*d^3*i^3*n^
2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^4)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2380

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(x_)^(m_.))/((d_) + (e_.)*
(x_)^(r_.)), x_Symbol] :> Dist[1/d, Int[x^m*(a + b*Log[c*x^n])^p, x], x] -
Dist[e/d, Int[(x^(m + r)*(a + b*Log[c*x^n])^p)/(d + e*x^r), x], x] /; FreeQ
[{a, b, c, d, e, m, n, r}, x] && IGtQ[p, 0] && IGtQ[r, 0] && ILtQ[m, -1]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(185c+185dx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx = \int \left(\frac{6331625(bc-ad)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^4(a+bx)^4} + \frac{189948\cdots}{}\right.$$

$$= \frac{(6331625d^3)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{b^3g^4} + \frac{(18994875d^2(bc-\cdots}{}$$

$$= -\frac{6331625(bc-ad)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^4g^4(a+bx)^3} - \frac{1899487\cdots}{}$$

$$= -\frac{6331625(bc-ad)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^4g^4(a+bx)^3} - \frac{1899487\cdots}{}$$

$$= -\frac{6331625(bc-ad)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^4g^4(a+bx)^3} - \frac{1899487\cdots}{}$$

$$= -\frac{6331625(bc-ad)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^4g^4(a+bx)^3} - \frac{1899487\cdots}{}$$

$$= -\frac{12663250B(bc-ad)^3 n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^4g^4(a+bx)^3} - \frac{44321\cdots}{}$$

$$= -\frac{6331625B^2d^3\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^4} - \frac{12663250B\cdots}{}$$

$$= -\frac{6331625B^2d^3\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^4} - \frac{6331625\cdots}{}$$

$$= -\frac{12663250B^2(bc-ad)^3n^2}{27b^4g^4(a+bx)^3} - \frac{107637625B^2d(bc-ad)^2n^2}{36b^4g^4(a+bx)^2}\cdots$$

$$= -\frac{12663250B^2(bc-ad)^3n^2}{27b^4g^4(a+bx)^3} - \frac{107637625B^2d(bc-ad)^2n^2}{36b^4g^4(a+bx)^2}\cdots$$

$$= -\frac{12663250B^2(bc-ad)^3n^2}{27b^4g^4(a+bx)^3} - \frac{107637625B^2d(bc-ad)^2n^2}{36b^4g^4(a+bx)^2}\cdots$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 8775 vs. $2(561) = 1122$.

time = 7.40, size = 8775, normalized size = 15.64

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^4,x]
```

```
[Out] Result too large to show
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{(dix+ci)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx+ag)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="maxima")
```

```
[Out] 1/3*I*A*B*c*d^2*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2
 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*
b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2
*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*
b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^
2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3
*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3
)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g
^4)) + 1/9*I*A*B*c^3*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2
 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^
3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 -
2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d
^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
 a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2
*c*d^2 - a^3*b*d^3)*g^4)) + 1/6*I*A*B*c^2*d*n*((5*a*b^2*c^2 - 22*a^2*b*c*d
```

```
+ 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d +
 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*
c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d
 + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) -
6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*
d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*
a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/6*I*A^2*d^3*((18*a*b
^2*x^2 + 27*a^2*b*x + 11*a^3)/(b^7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a^2*b^5*g^
4*x + a^3*b^4*g^4) + 6*log(b*x + a)/(b^4*g^4)) + I*(3*b*x + a)*A*B*c^2*d*lo
g((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2
*b^3*g^4*x + a^3*b^2*g^4) + 2*I*(3*b^2*x^2 + 3*a*b*x + a^2)*A*B*c*d^2*log((
b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^
4*g^4*x + a^3*b^3*g^4) + 1/2*I*(3*b*x + a)*A^2*c^2*d/(b^5*g^4*x^3 + 3*a*b^4
*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + I*(3*b^2*x^2 + 3*a*b*x + a^2)*A
^2*c*d^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) +
2/3*I*A*B*c^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^4*g^4*x^3 + 3*a*b^3
*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 1/3*I*A^2*c^3/(b^4*g^4*x^3 + 3*a*
b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 1/6*(18*(I*b^3*c*d^2 - I*a*b^2
*d^3)*B^2*x^2 + 9*(I*b^3*c^2*d + 2*I*a*b^2*c*d^2 - 3*I*a^2*b*d^3)*B^2*x - (
-2*I*b^3*c^3 - 3*I*a*b^2*c^2*d - 6*I*a^2*b*c*d^2 + 11*I*a^3*d^3)*B^2 + 6*(-
I*B^2*b^3*d^3*x^3 - 3*I*B^2*a*b^2*d^3*x^2 - 3*I*B^2*a^2*b*d^3*x - I*B^2*a^3
*d^3)*log(b*x + a))*log((d*x + c)^n)^2/(b^7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a
^2*b^5*g^4*x + a^3*b^4*g^4) + integrate(1/3*(-18*I*B^2*b^4*c^2*d^2*x^2 - 12
*I*B^2*b^4*c^3*d*x - 3*I*B^2*b^4*c^4 - 3*(2*I*A*B*b^4*d^4 + I*B^2*b^4*d^4)*
x^4 - 6*(I*A*B*b^4*c*d^3 + 2*I*B^2*b^4*c*d^3)*x^3 - 3*(I*B^2*b^4*d^4*x^4 +
4*I*B^2*b^4*c*d^3*x^3 + 6*I*B^2*b^4*c^2*d^2*x^2 + 4*I*B^2*b^4*c^3*d*x + I*B
^2*b^4*c^4)*log((b*x + a)^n)^2 - 6*(6*I*B^2*b^4*c^2*d^2*x^2 + 4*I*B^2*b^4*c
^3*d*x + I*B^2*b^4*c^4 + (I*A*B*b^4*d^4 + I*B^2*b^4*d^4)*x^4 + (I*A*B*b^4*c
*d^3 + 4*I*B^2*b^4*c*d^3)*x^3)*log((b*x + a)^n) - (9*(4*I*a*b^3*c*d^3*n - 5
*I*a^2*b^2*d^4*n + b^4*c^2*d^2*(I*n - 4*I))*B^2*x^2 + 6*(-I*A*B*b^4*d^4 - I
*B^2*b^4*d^4)*x^4 + 2*(6*I*a*b^3*c^2*d^2*n + 12*I*a^2*b^2*c*d^3*n - 19*I*a^
3*b*d^4*n + b^4*c^3*d*(I*n - 12*I))*B^2*x + 6*(-I*A*B*b^4*c*d^3 + (-3*I*a*b
^3*d^4*n + b^4*c*d^3*(3*I*n - 4*I))*B^2)*x^3 - (-2*I*a*b^3*c^3*d*n - 3*I*a^
2*b^2*c^2*d^2*n - 6*I*a^3*b*c*d^3*n + 11*I*a^4*d^4*n + 6*I*b^4*c^4)*B^2 + 6
*(-I*B^2*b^4*d^4*n*x^4 - 4*I*B^2*a*b^3*d^4*n*x^3 - 6*I*B^2*a^2*b^2*d^4*n*x^
2 - 4*I*B^2*a^3*b*d^4*n*x - I*B^2*a^4*d^4*n)*log(b*x + a) + 6*(-I*B^2*b^4*d
^4*x^4 - 4*I*B^2*b^4*c*d^3*x^3 - 6*I*B^2*b^4*c^2*d^2*x^2 - 4*I*B^2*b^4*c^3*
d*x - I*B^2*b^4*c^4)*log((b*x + a)^n))*log((d*x + c)^n))/(b^8*d*g^4*x^5 + a
^4*b^4*c*g^4 + (b^8*c*g^4 + 4*a*b^7*d*g^4)*x^4 + 2*(2*a*b^7*c*g^4 + 3*a^2*b
^6*d*g^4)*x^3 + 2*(3*a^2*b^6*c*g^4 + 2*a^3*b^5*d*g^4)*x^2 + (4*a^3*b^5*c*g^
4 + a^4*b^4*d*g^4)*x), x)
```

Fricas [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="fricas")
```

```
[Out] integral(((-I*A^2 - 2*I*A*B - I*B^2)*d^3*x^3 - 3*(I*A^2 + 2*I*A*B + I*B^2)*
c*d^2*x^2 - 3*(I*A^2 + 2*I*A*B + I*B^2)*c^2*d*x + (-I*A^2 - 2*I*A*B - I*B^2
)*c^3 + (-I*B^2*d^3*n^2*x^3 - 3*I*B^2*c*d^2*n^2*x^2 - 3*I*B^2*c^2*d*n^2*x -
 I*B^2*c^3*n^2)*log((b*x + a)/(d*x + c))^2 - 2*((I*A*B + I*B^2)*d^3*n*x^3 +
 3*(I*A*B + I*B^2)*c*d^2*n*x^2 + 3*(I*A*B + I*B^2)*c^2*d*n*x + (I*A*B + I*B
^2)*c^3*n)*log((b*x + a)/(d*x + c)))/(b^4*g^4*x^4 + 4*a*b^3*g^4*x^3 + 6*a^2
*b^2*g^4*x^2 + 4*a^3*b*g^4*x + a^4*g^4), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{i^3\left(\int \frac{A^2c^3}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{A^2d^3x^3}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{B^2c^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{2ABc^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{3A^2cd^2x^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{3A^2c^2dx}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{B^2d^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{2ABd^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{3B^2cd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{3B^2c^2dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{6ABcd^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx + \int \frac{6ABc^2dx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx\right)}{g^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4
,x)
```

```
[Out] i**3*(Integral(A**2*c**3/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x
**3 + b**4*x**4), x) + Integral(A**2*d**3*x**3/(a**4 + 4*a**3*b*x + 6*a**2*
b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(B**2*c**3*log(e*(a/(c
 + d*x) + b*x/(c + d*x))**n)**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a
*b**3*x**3 + b**4*x**4), x) + Integral(2*A*B*c**3*log(e*(a/(c + d*x) + b*x/
(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4
*x**4), x) + Integral(3*A**2*c*d**2*x**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x
**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(3*A**2*c**2*d*x/(a**4 + 4*a
**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(B**2
*d**3*x**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a**4 + 4*a**3*b*x +
6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(2*A*B*d**3*x**
3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*
x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integral(3*B**2*c*d**2*x**2*log(e*(
a/(c + d*x) + b*x/(c + d*x))**n)**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 +
 4*a*b**3*x**3 + b**4*x**4), x) + Integral(3*B**2*c**2*d*x*log(e*(a/(c + d*
x) + b*x/(c + d*x))**n)**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3
*x**3 + b**4*x**4), x) + Integral(6*A*B*c*d**2*x**2*log(e*(a/(c + d*x) + b*
x/(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b*
*4*x**4), x) + Integral(6*A*B*c**2*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))*
*n)/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x))
/g**4
```

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{(a\,g+b\,g\,x)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^4,x)
```

```
[Out] int(((c*i + d*i*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^4, x)
```

3.186 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=768

$$\frac{bB^2(bc-ad)^2g^3n^2x}{3d^3i}+\frac{7B(bc-ad)^2g^3n(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d^3i}-\frac{b^2B(bc-ad)g^3n(c+dx)^2\left(A+B\right.}{3d^4i}$$

```
[Out] 1/3*b*B^2*(-a*d+b*c)^2*g^3*n^2*x/d^3/i+7/3*B*(-a*d+b*c)^2*g^3*n*(b*x+a)*(A+
B*ln(e*((b*x+a)/(d*x+c))^n))/d^3/i-1/3*b^2*B*(-a*d+b*c)*g^3*n*(d*x+c)^2*(A+
B*ln(e*((b*x+a)/(d*x+c))^n))/d^4/i+3*(-a*d+b*c)^2*g^3*(b*x+a)*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))^2/d^3/i-3/2*b^2*(-a*d+b*c)*g^3*(d*x+c)^2*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))^2/d^4/i+1/3*b^3*g^3*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^
n))^2/d^4/i+6*B*(-a*d+b*c)^3*g^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d
+b*c)/b/(d*x+c))/d^4/i+(-a*d+b*c)^3*g^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*l
n((-a*d+b*c)/b/(d*x+c))/d^4/i+1/3*B^2*(-a*d+b*c)^3*g^3*n^2*ln((b*x+a)/(d*x+
c))/d^4/i-2*B^2*(-a*d+b*c)^3*g^3*n^2*ln(d*x+c)/d^4/i-7/3*B*(-a*d+b*c)^3*g^3
*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x+a))/d^4/i+6*B^2*(-
a*d+b*c)^3*g^3*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i+2*B*(-a*d+b*c)^3*g^
3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i+7/
3*B^2*(-a*d+b*c)^3*g^3*n^2*polylog(2,b*(d*x+c)/d/(b*x+a))/d^4/i-2*B^2*(-a*d
+b*c)^3*g^3*n^2*polylog(3,d*(b*x+a)/b/(d*x+c))/d^4/i
```

Rubi [A]
time = 0.66, antiderivative size = 768, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 13, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.289$, Rules used = {2561, 2395, 2356, 2389, 2379, 2438, 2351, 31, 46, 2355, 2354, 2421, 6724}

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
),x]
```

```
[Out] (b*B^2*(b*c - a*d)^2*g^3*n^2*x)/(3*d^3*i) + (7*B*(b*c - a*d)^2*g^3*n*(a + b
*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^3*i) - (b^2*B*(b*c - a*d)*
g^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^4*i) + (3*(b
*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3*i)
 - (3*b^2*(b*c - a*d)*g^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(2*d^4*i) + (b^3*g^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(3*d^4*i) + (6*B*(b*c - a*d)^3*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i) + ((b*c - a*d)^3*g^3*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i) +
(B^2*(b*c - a*d)^3*g^3*n^2*Log[(a + b*x)/(c + d*x)])/(3*d^4*i) - (2*B^2*(b*
```

```
c - a*d)^3*g^3*n^2*Log[c + d*x])/(d^4*i) - (7*B*(b*c - a*d)^3*g^3*n*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*d^
4*i) + (6*B^2*(b*c - a*d)^3*g^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]
)/(d^4*i) + (2*B*(b*c - a*d)^3*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i) + (7*B^2*(b*c - a*d)^3*g^
3*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(3*d^4*i) - (2*B^2*(b*c - a*
d)^3*g^3*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
```

```
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] && !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186c+186dx}\,dx = \int\left(\frac{b(bc-ad)^2g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3} + \frac{(-bc+ad)^3g^3(}{d^3(1}\right.$$

$$= \frac{(bg)\int(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx}{186d} - \frac{(b(bc-ad)}{}$$

$$= \frac{b(bc-ad)^2g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3} - \frac{(bc-ad)g^3(a+bx}{}$$

$$= \frac{b(bc-ad)^2g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3} - \frac{(bc-ad)g^3(a+bx}{}$$

$$= \frac{b(bc-ad)^2g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3} - \frac{(bc-ad)g^3(a+bx}{}$$

$$= \frac{b(bc-ad)^2g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3} - \frac{(bc-ad)g^3(a+bx}{}$$

$$= \frac{5AbB(bc-ad)^2g^3nx}{558d^3} - \frac{B(bc-ad)g^3n(a+bx)^2\left(A+B\log\right.}{558d^2}$$

$$= \frac{5AbB(bc-ad)^2g^3nx}{558d^3} + \frac{5B^2(bc-ad)^2g^3n(a+bx)\log\left(e\left(\frac{a+b}{c+d}\right.\right.}{558d^3}$$

$$= \frac{5AbB(bc-ad)^2g^3nx}{558d^3} + \frac{5B^2(bc-ad)^2g^3n(a+bx)\log\left(e\left(\frac{a+b}{c+d}\right.\right.}{558d^3}$$

$$= \frac{5AbB(bc-ad)^2g^3nx}{558d^3} + \frac{bB^2(bc-ad)^2g^3n^2x}{558d^3} + \frac{5B^2(bc-ad)}{}$$

$$= \frac{5AbB(bc-ad)^2g^3nx}{558d^3} + \frac{bB^2(bc-ad)^2g^3n^2x}{558d^3} - \frac{aB^2(bc-ad)}{}$$

$$= \frac{5AbB(bc-ad)^2g^3nx}{558d^3} + \frac{bB^2(bc-ad)^2g^3n^2x}{558d^3} - \frac{aB^2(bc-ad)}{}$$

$$= \frac{5AbB(bc-ad)^2g^3nx}{558d^3} + \frac{bB^2(bc-ad)^2g^3n^2x}{558d^3} - \frac{aB^2(bc-ad)}{}$$

$$= \frac{5AbB(bc-ad)^2g^3nx}{558d^3} + \frac{bB^2(bc-ad)^2g^3n^2x}{558d^3} - \frac{aB^2(bc-ad)}{}$$

$$= \frac{5AbB(bc-ad)^2g^3nx}{558d^3} + \frac{bB^2(bc-ad)^2g^3n^2x}{558d^3} - \frac{aB^2(bc-ad)}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 3265 vs. $2(768) = 1536$.
time = 2.77, size = 3265, normalized size = 4.25

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x),x]
```

```
[Out] (g^3*(6*b*d*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*x*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 - 3*b^2*d^2*(b*c - 3*a*d)*x^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 2
*b^3*d^3*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c +
 d*x)])^2 - 6*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log
[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + 18*a*B*d*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*b^2*c^2 + 2*a*b*c*d - b^2
*c*d*x + a*b*d^2*x + 2*b^2*c^2*Log[c/d + x] - b^2*c^2*Log[c/d + x]^2 - a^2*
d^2*Log[a + b*x] - 2*b^2*c*d*x*Log[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*Log[(
a + b*x)/(c + d*x)] + b^2*c^2*Log[c + d*x] + 2*b^2*c^2*Log[c/d + x]*Log[c +
 d*x] + 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[c + d*x] - 2*b*c*Log[a/b + x
]*(a*d + b*c*Log[c + d*x] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*b^2*c^2
*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*n*(-A - B*Log[e*((a + b*x)
/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(6*b^3*c^3 - 6*a*b^2*c^2*d +
 5*b^3*c^2*d*x - 3*a*b^2*c*d^2*x - 2*a^2*b*d^3*x - b^3*c*d^2*x^2 + a*b^2*d^
3*x^2 - 6*b^3*c^3*Log[c/d + x] + 3*b^3*c^3*Log[c/d + x]^2 + 3*a^2*b*c*d^2*L
og[a + b*x] + 2*a^3*d^3*Log[a + b*x] + 6*b^3*c^2*d*x*Log[(a + b*x)/(c + d*x
)] - 3*b^3*c*d^2*x^2*Log[(a + b*x)/(c + d*x)] + 2*b^3*d^3*x^3*Log[(a + b*x)
/(c + d*x)] - 5*b^3*c^3*Log[c + d*x] - 6*b^3*c^3*Log[c/d + x]*Log[c + d*x]
- 6*b^3*c^3*Log[(a + b*x)/(c + d*x)]*Log[c + d*x] + 6*b^2*c^2*Log[a/b + x]*
(a*d + b*c*Log[c + d*x] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]) - 6*b^3*c^3*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 6*a^3*B*d^3*n*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[c/d + x]^2 + 2*(Lo
g[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)])*Log[c + d*x] - 2*(Log
[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c)
 + a*d)])) - 18*a^2*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log
[(a + b*x)/(c + d*x)])*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c + d*x)*
(-1 + Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/d + x]
 - Log[(a + b*x)/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[a/b + x]*L
og[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))
+ 18*a^2*B^2*d^2*n^2*(d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 + b*c*Log[(a +
 b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*c -
 a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)
/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)]) + 2*b*c*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b
```

```
*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) + 9*a*B^2*d*n^2*(2
*d*(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)/(c + d*x)] - 2*a^2*d^2*Log[a + b*
x]*Log[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)]^2 - 2*b*
c*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 + 2*(b*c - a*d)^2*Log[c + d*x] - 2
*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*b^2*c^
2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + a^2*d^2*(Log[
a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (
d*(a + b*x))/(-(b*c) + a*d)]) + b^2*c^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*
Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(b*c - a*d)*(Log[(b*c - a*d)/(b
*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)/(c + d*
x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)]) - 4*b^2*c^2*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) - 6*a^3*B^2*d^3*n^2*(L
og[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*Log[(a + b*x)/
(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 2*PolyLog[3, (d*(a + b
*x))/(b*(c + d*x))]) + B^2*n^2*(2*b^3*c^2*d*x - 4*a*b^2*c*d^2*x + 2*a^2*b*d
^3*x + 2*a^2*b*c*d^2*Log[a + b*x] - 2*a^3*d^3*Log[a + b*x] - 3*a^2*b*c*d^2*
Log[a + b*x]^2 - 2*a^3*d^3*Log[a + b*x]^2 + 10*a*b^2*c^2*d*Log[(a + b*x)/(c
 + d*x)] - 6*a^2*b*c*d^2*Log[(a + b*x)/(c + d*x)] - 4*a^3*d^3*Log[(a + b*x)
/(c + d*x)] + 10*b^3*c^2*d*x*Log[(a + b*x)/(c + d*x)] - 6*a*b^2*c*d^2*x*Log
[(a + b*x)/(c + d*x)] - 4*a^2*b*d^3*x*Log[(a + b*x)/(c + d*x)] - 2*b^3*c*d^
2*x^2*Log[(a + b*x)/(c + d*x)] + 2*a*b^2*d^3*x^2*Log[(a + b*x)/(c + d*x)] +
 6*a^2*b*c*d^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + 4*a^3*d^3*Log[a + b*
x]*Log[(a + b*x)/(c + d*x)] + 6*a*b^2*c^2*d*Log[(a + b*x)/(c + d*x)]^2 + 6*
b^3*c^2*d*x*Log[(a + b*x)/(c + d*x)]^2 - 3*b^3*c*d^2*x^2*Log[(a + b*x)/(c +
 d*x)]^2 + 2*b^3*d^3*x^3*Log[(a + b*x)/(c + d*x)]^2 - 12*b^3*c^3*Log[c + d*
x] + 18*a*b^2*c^2*d*Log[c + d*x] - 2*a^2*b*c*d^2*Log[c + d*x] - 4*a^3*d^3*L
og[c + d*x] + 6*a^2*b*c*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 4
*a^3*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 22*b^3*c^3*Log[(d*(a
 + b*x))/(-(b*c) + a*d)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 12*a*b^2*c^2*d*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)]*Log[(b*c - a*d)...
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] 3*A^2*a^2*b*g^3*(-I*x/d + I*c*log(d*x + c)/d^2) - 1/6*A^2*b^3*g^3*(-6*I*c^3
*log(d*x + c)/d^4 + I*(2*d^2*x^3 - 3*c*d*x^2 + 6*c^2*x)/d^3) - 3/2*A^2*a*b^
2*g^3*(2*I*c^2*log(d*x + c)/d^3 + I*(d*x^2 - 2*c*x)/d^2) - I*A^2*a^3*g^3*lo
g(I*d*x + I*c)/d - 1/6*(2*I*B^2*b^3*d^3*g^3*x^3 - 3*(I*b^3*c*d^2*g^3 - 3*I*
a*b^2*d^3*g^3)*B^2*x^2 - 6*(-I*b^3*c^2*d*g^3 + 3*I*a*b^2*c*d^2*g^3 - 3*I*a^
2*b*d^3*g^3)*B^2*x - 6*(I*b^3*c^3*g^3 - 3*I*a*b^2*c^2*d*g^3 + 3*I*a^2*b*c*d
^2*g^3 - I*a^3*d^3*g^3)*B^2*log(d*x + c))*log((d*x + c)^n)^2/d^4 + integrat
e(1/3*(-6*I*A*B*a^3*d^3*g^3 - 3*I*B^2*a^3*d^3*g^3 - 3*(2*I*A*B*b^3*d^3*g^3
+ I*B^2*b^3*d^3*g^3)*x^3 - 9*(2*I*A*B*a*b^2*d^3*g^3 + I*B^2*a*b^2*d^3*g^3)*
x^2 - 3*(I*B^2*b^3*d^3*g^3*x^3 + 3*I*B^2*a*b^2*d^3*g^3*x^2 + 3*I*B^2*a^2*b*
d^3*g^3*x + I*B^2*a^3*d^3*g^3)*log((b*x + a)^n)^2 - 9*(2*I*A*B*a^2*b*d^3*g^
3 + I*B^2*a^2*b*d^3*g^3)*x - 6*(I*A*B*a^3*d^3*g^3 + I*B^2*a^3*d^3*g^3 + (I*
A*B*b^3*d^3*g^3 + I*B^2*b^3*d^3*g^3)*x^3 + 3*(I*A*B*a*b^2*d^3*g^3 + I*B^2*a
*b^2*d^3*g^3)*x^2 + 3*(I*A*B*a^2*b*d^3*g^3 + I*B^2*a^2*b*d^3*g^3)*x)*log((b
*x + a)^n) + (6*I*A*B*a^3*d^3*g^3 + 6*I*B^2*a^3*d^3*g^3 - 2*(B^2*b^3*d^3*g^
3*(-I*n - 3*I) - 3*I*A*B*b^3*d^3*g^3)*x^3 - 6*(I*b^3*c^3*g^3*n - 3*I*a*b^2*
c^2*d*g^3*n + 3*I*a^2*b*c*d^2*g^3*n - I*a^3*d^3*g^3*n)*B^2*log(d*x + c) - 3
*(-6*I*A*B*a*b^2*d^3*g^3 + (I*b^3*c*d^2*g^3*n + 3*a*b^2*d^3*g^3*(-I*n - 2*I
))*B^2)*x^2 - 6*(-3*I*A*B*a^2*b*d^3*g^3 + (-I*b^3*c^2*d*g^3*n + 3*I*a*b^2*c
*d^2*g^3*n + 3*a^2*b*d^3*g^3*(-I*n - I))*B^2)*x - 6*(-I*B^2*b^3*d^3*g^3*x^3
 - 3*I*B^2*a*b^2*d^3*g^3*x^2 - 3*I*B^2*a^2*b*d^3*g^3*x - I*B^2*a^3*d^3*g^3)
*log((b*x + a)^n))*log((d*x + c)^n))/(d^4*x + c*d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] integral(((-I*A^2 - 2*I*A*B - I*B^2)*b^3*g^3*x^3 - 3*(I*A^2 + 2*I*A*B + I*B
^2)*a*b^2*g^3*x^2 - 3*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b*g^3*x + (-I*A^2 - 2*I
*A*B - I*B^2)*a^3*g^3 + (-I*B^2*b^3*g^3*n^2*x^3 - 3*I*B^2*a*b^2*g^3*n^2*x^2
 - 3*I*B^2*a^2*b*g^3*n^2*x - I*B^2*a^3*g^3*n^2)*log((b*x + a)/(d*x + c))^2
- 2*((I*A*B + I*B^2)*b^3*g^3*n*x^3 + 3*(I*A*B + I*B^2)*a*b^2*g^3*n*x^2 + 3*
```

```
(I*A*B + I*B^2)*a^2*b*g^3*n*x + (I*A*B + I*B^2)*a^3*g^3*n)*log((b*x + a)/(d
*x + c)))/(d*x + c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g^3\left(\int \frac{A^2a^3}{c+dx}\,dx + \int \frac{A^2b^3x^3}{c+dx}\,dx + \int \frac{B^2a^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx + \int \frac{2ABa^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx + \int \frac{3A^2ab^2x^2}{c+dx}\,dx + \int \frac{3A^2a^2bx}{c+dx}\,dx + \int \frac{B^2b^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx + \int \frac{2ABb^3x^3\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx + \int \frac{3B^2ab^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx + \int \frac{3B^2a^2bx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx + \int \frac{6ABab^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx + \int \frac{6ABa^2bx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i),x)
```

```
[Out] g**3*(Integral(A**2*a**3/(c + d*x), x) + Integral(A**2*b**3*x**3/(c + d*x),
 x) + Integral(B**2*a**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c + d*
x), x) + Integral(2*A*B*a**3*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d
*x), x) + Integral(3*A**2*a*b**2*x**2/(c + d*x), x) + Integral(3*A**2*a**2*
b*x/(c + d*x), x) + Integral(B**2*b**3*x**3*log(e*(a/(c + d*x) + b*x/(c + d
*x))**n)**2/(c + d*x), x) + Integral(2*A*B*b**3*x**3*log(e*(a/(c + d*x) + b
*x/(c + d*x))**n)/(c + d*x), x) + Integral(3*B**2*a*b**2*x**2*log(e*(a/(c +
 d*x) + b*x/(c + d*x))**n)**2/(c + d*x), x) + Integral(3*B**2*a**2*b*x*log(
e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c + d*x), x) + Integral(6*A*B*a*b**
2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x) + Integral(6*A
*B*a**2*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x))/i
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(I*d*x +
 I*c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{c\,i+d\,i\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
),x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
), x)
```

3.187 $\int \frac{(ag+bgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=573

$$-\frac{B(bc-ad)g^2n(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d^2i}-\frac{2(bc-ad)g^2(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d^2i}+\frac{b^2g^2(c+\cdots}{}$$

```
[Out] -B*(-a*d+b*c)*g^2*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^2/i-2*(-a*d+b
*c)*g^2*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^2/i+1/2*b^2*g^2*(d*x+c)
^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^3/i-4*B*(-a*d+b*c)^2*g^2*n*(A+B*ln(e
*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/d^3/i-(-a*d+b*c)^2*g^2*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))^2*ln((-a*d+b*c)/b/(d*x+c))/d^3/i+B^2*(-a*d+b*c)
^2*g^2*n^2*ln(d*x+c)/d^3/i+B*(-a*d+b*c)^2*g^2*n*(A+B*ln(e*((b*x+a)/(d*x+c))
^n))*ln(1-b*(d*x+c)/d/(b*x+a))/d^3/i-4*B^2*(-a*d+b*c)^2*g^2*n^2*polylog(2,d
*(b*x+a)/b/(d*x+c))/d^3/i-2*B*(-a*d+b*c)^2*g^2*n*(A+B*ln(e*((b*x+a)/(d*x+c)
)^n))*polylog(2,d*(b*x+a)/b/(d*x+c))/d^3/i-B^2*(-a*d+b*c)^2*g^2*n^2*polylog
(2,b*(d*x+c)/d/(b*x+a))/d^3/i+2*B^2*(-a*d+b*c)^2*g^2*n^2*polylog(3,d*(b*x+a
)/b/(d*x+c))/d^3/i
```

Rubi [A]
time = 0.45, antiderivative size = 573, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2561, 2395, 2356, 2389, 2379, 2438, 2351, 31, 2355, 2354, 2421, 6724}

$$-\frac{2Bg^2n(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i}-\frac{4B^2g^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}-\frac{B^2g^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{d^3i}+\frac{2B^2g^2n^2(bc-ad)^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}+\frac{b^2g^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2d^3i}-\frac{g^2(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^3i}-\frac{4Bg^2n(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i}+\frac{Bg^2n(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i}-\frac{2g^2(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^2i}-\frac{Bg^2n(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i}+\frac{B^2g^2n^2(bc-ad)^2\log(c+dx)}{d^3i}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
),x]
```

```
[Out] -((B*(b*c - a*d)*g^2*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d
^2*i)) - (2*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(d^2*i) + (b^2*g^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2)/(2*d^3*i) - (4*B*(b*c - a*d)^2*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i) - ((b*c - a*d)^2*g^2*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i) + (B
^2*(b*c - a*d)^2*g^2*n^2*Log[c + d*x])/(d^3*i) + (B*(b*c - a*d)^2*g^2*n*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(
d^3*i) - (4*B^2*(b*c - a*d)^2*g^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)
)])/(d^3*i) - (2*B*(b*c - a*d)^2*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i) - (B^2*(b*c - a*d)^2*g^
2*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(d^3*i) + (2*B^2*(b*c - a*d)
^2*g^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
```

```
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187c+187dx}\,dx=\int\left(-\frac{b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2}+\frac{(bc-ad)^2g^2(}{d^2(1}\right.$$

$$=\frac{(bg)\int(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx}{187d}-\frac{(b(bc-ad)g}{}$$

$$=-\frac{b(bc-ad)g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2}+\frac{g^2(a+bx)^2\left(A+\right.}{3}$$

$$=-\frac{b(bc-ad)g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2}+\frac{g^2(a+bx)^2\left(A+\right.}{3}$$

$$=-\frac{b(bc-ad)g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2}+\frac{g^2(a+bx)^2\left(A+\right.}{3}$$

$$=-\frac{b(bc-ad)g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2}+\frac{g^2(a+bx)^2\left(A+\right.}{3}$$

$$=-\frac{AbB(bc-ad)g^2nx}{187d^2}-\frac{2aB(bc-ad)g^2n\log(a+bx)\left(A+B\right.}{187d^2}$$

$$=-\frac{AbB(bc-ad)g^2nx}{187d^2}-\frac{B^2(bc-ad)g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.}{187d^2}$$

$$=-\frac{AbB(bc-ad)g^2nx}{187d^2}-\frac{B^2(bc-ad)g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.}{187d^2}$$

$$=-\frac{AbB(bc-ad)g^2nx}{187d^2}-\frac{B^2(bc-ad)g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.}{187d^2}$$

$$=-\frac{AbB(bc-ad)g^2nx}{187d^2}+\frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2}-\frac{B^2}{}$$

$$=-\frac{AbB(bc-ad)g^2nx}{187d^2}+\frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2}-\frac{B^2}{}$$

$$=-\frac{AbB(bc-ad)g^2nx}{187d^2}+\frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2}-\frac{B^2}{}$$

$$=-\frac{AbB(bc-ad)g^2nx}{187d^2}+\frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2}-\frac{B^2}{}$$

$$=-\frac{AbB(bc-ad)g^2nx}{187d^2}+\frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2}-\frac{B^2}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1741 vs. $2(573) = 1146$.
time = 1.02, size = 1741, normalized size = 3.04

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x),x]
```

```
[Out] (g^2*(-2*b*d*(b*c - 2*a*d)*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Lo
g[(a + b*x)/(c + d*x)])^2 + b^2*d^2*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 2*(b*c - a*d)^2*(A + B*Log[e*((a + b
*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + 2*B*n*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*b^2
*c^2 + 2*a*b*c*d - b^2*c*d*x + a*b*d^2*x + 2*b^2*c^2*Log[c/d + x] - b^2*c^2
*Log[c/d + x]^2 - a^2*d^2*Log[a + b*x] - 2*b^2*c*d*x*Log[(a + b*x)/(c + d*x
)] + b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)] + b^2*c^2*Log[c + d*x] + 2*b^2*c^
2*Log[c/d + x]*Log[c + d*x] + 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[c + d*
x] - 2*b*c*Log[a/b + x]*(a*d + b*c*Log[c + d*x] - b*c*Log[(b*(c + d*x))/(b*
c - a*d)]) + 2*b^2*c^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*a^2*B*
d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])
*(Log[c/d + x]^2 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)
])*Log[c + d*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[
2, (d*(a + b*x))/(-(b*c) + a*d)])) - 4*a*B*d*n*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*d*(a + b*x)*(-1 + Log[a/b + x
]) + 2*b*(c + d*x)*(-1 + Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b
+ x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*
b*c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))
/(-(b*c) + a*d)])) + 4*a*B^2*d*n^2*(d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2
+ b*c*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*
d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2
*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d
*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) + B^
2*n^2*(2*d*(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)/(c + d*x)] - 2*a^2*d^2*Lo
g[a + b*x]*Log[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)]^
2 - 2*b*c*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 + 2*(b*c - a*d)^2*Log[c +
d*x] - 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] -
2*b^2*c^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + a^2*d
^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Poly
Log[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b^2*c^2*(Log[(b*c - a*d)/(b*c + b*d
*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)])
 - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(b*c - a*d)*(Log[(b*c -
 a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)
```

```
/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)]) - 4*b^2*c^2*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x)
)/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) - 2*a^2*B^2*d^
2*n^2*(Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*Log[(a
 + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 2*PolyLog[3, (
d*(a + b*x))/(b*(c + d*x))])))/(2*d^3*i)
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] 2*A^2*a*b*g^2*(-I*x/d + I*c*log(d*x + c)/d^2) - 1/2*A^2*b^2*g^2*(2*I*c^2*lo
g(d*x + c)/d^3 + I*(d*x^2 - 2*c*x)/d^2) - I*A^2*a^2*g^2*log(I*d*x + I*c)/d
- 1/2*(I*B^2*b^2*d^2*g^2*x^2 - 2*(I*b^2*c*d*g^2 - 2*I*a*b*d^2*g^2)*B^2*x -
2*(-I*b^2*c^2*g^2 + 2*I*a*b*c*d*g^2 - I*a^2*d^2*g^2)*B^2*log(d*x + c))*log(
(d*x + c)^n)^2/d^3 + integrate((-2*I*A*B*a^2*d^2*g^2 - I*B^2*a^2*d^2*g^2 +
(-2*I*A*B*b^2*d^2*g^2 - I*B^2*b^2*d^2*g^2)*x^2 + (-I*B^2*b^2*d^2*g^2*x^2 -
2*I*B^2*a*b*d^2*g^2*x - I*B^2*a^2*d^2*g^2)*log((b*x + a)^n)^2 - 2*(2*I*A*B*
a*b*d^2*g^2 + I*B^2*a*b*d^2*g^2)*x - 2*(I*A*B*a^2*d^2*g^2 + I*B^2*a^2*d^2*g
^2 + (I*A*B*b^2*d^2*g^2 + I*B^2*b^2*d^2*g^2)*x^2 + 2*(I*A*B*a*b*d^2*g^2 + I
*B^2*a*b*d^2*g^2)*x)*log((b*x + a)^n) + (2*I*A*B*a^2*d^2*g^2 + 2*I*B^2*a^2*
d^2*g^2 - 2*(-I*b^2*c^2*g^2*n + 2*I*a*b*c*d*g^2*n - I*a^2*d^2*g^2*n)*B^2*lo
g(d*x + c) + (B^2*b^2*d^2*g^2*(I*n + 2*I) + 2*I*A*B*b^2*d^2*g^2)*x^2 - 2*(-
2*I*A*B*a*b*d^2*g^2 + (I*b^2*c*d*g^2*n + 2*a*b*d^2*g^2*(-I*n - I))*B^2)*x -
 2*(-I*B^2*b^2*d^2*g^2*x^2 - 2*I*B^2*a*b*d^2*g^2*x - I*B^2*a^2*d^2*g^2)*log
((b*x + a)^n))*log((d*x + c)^n))/(d^3*x + c*d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] integral(((-I*A^2 - 2*I*A*B - I*B^2)*b^2*g^2*x^2 - 2*(I*A^2 + 2*I*A*B + I*B
^2)*a*b*g^2*x + (-I*A^2 - 2*I*A*B - I*B^2)*a^2*g^2 + (-I*B^2*b^2*g^2*n^2*x^
2 - 2*I*B^2*a*b*g^2*n^2*x - I*B^2*a^2*g^2*n^2)*log((b*x + a)/(d*x + c))^2 -
 2*((I*A*B + I*B^2)*b^2*g^2*n*x^2 + 2*(I*A*B + I*B^2)*a*b*g^2*n*x + (I*A*B
+ I*B^2)*a^2*g^2*n)*log((b*x + a)/(d*x + c)))/(d*x + c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g^2\left(\int \frac{A^2a^2}{c+dx}\,dx+\int \frac{A^2b^2x^2}{c+dx}\,dx+\int \frac{B^2a^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx+\int \frac{2ABa^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx+\int \frac{2A^2abx}{c+dx}\,dx+\int \frac{B^2b^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx+\int \frac{2ABb^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx+\int \frac{2B^2abx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx+\int \frac{4ABabx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i),x)
```

```
[Out] g**2*(Integral(A**2*a**2/(c + d*x), x) + Integral(A**2*b**2*x**2/(c + d*x),
 x) + Integral(B**2*a**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c + d*
x), x) + Integral(2*A*B*a**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d
*x), x) + Integral(2*A**2*a*b*x/(c + d*x), x) + Integral(B**2*b**2*x**2*log
(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c + d*x), x) + Integral(2*A*B*b**2
*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x) + Integral(2*B*
*2*a*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c + d*x), x) + Integra
l(4*A*B*a*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x))/i
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(I*d*x +
 I*c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{c\,i+d\,i\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
),x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
), x)
```

3.188 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=303

$$\frac{g(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{di}+\frac{2B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)}{d^2i}+\frac{(bc-ad)g(A+B}{}$$

```
[Out] g*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d/i+2*B*(-a*d+b*c)*g*n*(A+B*ln(
e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/d^2/i+(-a*d+b*c)*g*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))^2*ln((-a*d+b*c)/b/(d*x+c))/d^2/i+2*B^2*(-a*d+b*c)*
g*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/d^2/i+2*B*(-a*d+b*c)*g*n*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))*polylog(2,d*(b*x+a)/b/(d*x+c))/d^2/i-2*B^2*(-a*d+b*c)*g*
n^2*polylog(3,d*(b*x+a)/b/(d*x+c))/d^2/i
```

Rubi [A]

time = 0.23, antiderivative size = 303, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.163$, Rules used = {2561, 2395, 2355, 2354, 2438, 2421, 6724}

$$\frac{2Bgn(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i}+\frac{2B^2gn^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}-\frac{2B^2gn^2(bc-ad)\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}+\frac{2Bgn(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i}+\frac{g(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^2i}+\frac{g(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{di}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x),
x]
```

```
[Out] (g*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d*i) + (2*B*(b*c -
a*d)*g*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x
))])/(d^2*i) + ((b*c - a*d)*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[
(b*c - a*d)/(b*(c + d*x))])/(d^2*i) + (2*B^2*(b*c - a*d)*g*n^2*PolyLog[2, (
d*(a + b*x))/(b*(c + d*x))])/(d^2*i) + (2*B*(b*c - a*d)*g*n*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i) -
(2*B^2*(b*c - a*d)*g*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
```

```
, p}, x] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188c+188dx}\,dx = \int \left(\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} + \frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{188d(c+dx)}\right.$$

$$= \frac{(bg)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx}{188d} - \frac{((bc-ad)g)\int\frac{\left(A+B\log\left(e\left(\right.\right.\right.}{c+d}}{188d}$$

$$= \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{188d^2}$$

$$= \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{188d^2}$$

$$= \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{188d^2}$$

$$= \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{188d^2}$$

$$= \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bgx\left(A+B\log\left(e\left(\right.\right.\right.}{188d}$$

$$= \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bgx\left(A+B\log\left(e\left(\right.\right.\right.}{188d}$$

$$= \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bgx\left(A+B\log\left(e\left(\right.\right.\right.}{188d}$$

$$= \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bgx\left(A+B\log\left(e\left(\right.\right.\right.}{188d}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{94d}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{94d}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{94d}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{94d}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{94d}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 802 vs. 2(303) = 606.
time = 0.39, size = 802, normalized size = 2.65

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d
*i*x),x]
```

```
[Out] -((g*(-(b*d*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c
 + d*x)])^2) + (b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(
a + b*x)/(c + d*x)])^2*Log[c + d*x] + a*B*d*n*(A + B*Log[e*((a + b*x)/(c +
d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[c/d + x]^2 + 2*(Log[a/b + x]
- Log[c/d + x] - Log[(a + b*x)/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b + x]*L
og[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))
+ B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])
*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c + d*x)*(-1 + Log[c/d + x]) -
b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c +
d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c
- a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) - B^2*n^2*(d*(a + b*x)
*Log[(a + b*x)/(c + d*x)]^2 + b*c*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d
)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)/(b*
c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(Log[(a + b
*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a +
 b*x))/(b*(c + d*x))])) + a*B^2*d*n^2*(Log[(a + b*x)/(c + d*x)]^2*Log[(b*c
- a*d)/(b*c + b*d*x)] + 2*Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))
/(b*(c + d*x))] - 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^2*i))
```

Maple [F]
time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx+ag\right)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{dix+ci}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] A^2*b*g*(-I*x/d + I*c*log(d*x + c)/d^2) - I*A^2*a*g*log(I*d*x + I*c)/d - (I
*B^2*b*d*g*x + (-I*b*c*g + I*a*d*g)*B^2*log(d*x + c))*log((d*x + c)^n)^2/d^
2 + integrate((-2*I*A*B*a*d*g - I*B^2*a*d*g + (-I*B^2*b*d*g*x - I*B^2*a*d*g
)*log((b*x + a)^n)^2 + (-2*I*A*B*b*d*g - I*B^2*b*d*g)*x - 2*(I*A*B*a*d*g +
I*B^2*a*d*g + (I*A*B*b*d*g + I*B^2*b*d*g)*x)*log((b*x + a)^n) - 2*(-I*A*B*a
*d*g - I*B^2*a*d*g + (I*b*c*g*n - I*a*d*g*n)*B^2*log(d*x + c) + (B^2*b*d*g*
(-I*n - I) - I*A*B*b*d*g)*x + (-I*B^2*b*d*g*x - I*B^2*a*d*g)*log((b*x + a)^
n))*log((d*x + c)^n))/(d^2*x + c*d), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] integral(((-I*A^2 - 2*I*A*B - I*B^2)*b*g*x + (-I*A^2 - 2*I*A*B - I*B^2)*a*g
 + (-I*B^2*b*g*n^2*x - I*B^2*a*g*n^2)*log((b*x + a)/(d*x + c))^2 - 2*((I*A*
B + I*B^2)*b*g*n*x + (I*A*B + I*B^2)*a*g*n)*log((b*x + a)/(d*x + c)))/(d*x
+ c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g\left(\int \frac{A^2a}{c+dx}\,dx+\int \frac{A^2bx}{c+dx}\,dx+\int \frac{B^2a\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx+\int \frac{2ABa\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx+\int \frac{B^2bx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx+\int \frac{2ABbx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx\right)}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i),x)
```

```
[Out] g*(Integral(A**2*a/(c + d*x), x) + Integral(A**2*b*x/(c + d*x), x) + Integr
al(B**2*a*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c + d*x), x) + Integr
al(2*A*B*a*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x) + Integral
(B**2*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c + d*x), x) + Integr
al(2*A*B*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c + d*x), x))/i
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(I*d*x + I
*c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x),
x)
```

```
[Out] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x),
 x)
```

3.189 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=137

$$-\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)}{di}-\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\mathrm{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)}{di}+\frac{2B^2n^2\mathrm{Li}_3\left(\frac{d(a+bx)}{b(c+dx)}\right)}{di}$$

```
[Out] -(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln((-a*d+b*c)/b/(d*x+c))/d/i-2*B*n*(A+B*
ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,d*(b*x+a)/b/(d*x+c))/d/i+2*B^2*n^2*pol
ylog(3,d*(b*x+a)/b/(d*x+c))/d/i
```

Rubi [A]
time = 0.08, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.114$, Rules used = {2551, 2354, 2421, 6724}

$$-\frac{2Bn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di}+\frac{2B^2n^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{di}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{di}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x),x]
```

```
[Out] -(((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])
/(d*i)) - (2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a +
b*x))/(b*(c + d*x))])/(d*i) + (2*B^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d
*x))])/(d*i)
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2551

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(m +
```

```
1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c -
 a*d, 0] && IntegersQ[m, p] && EqQ[d*f - c*g, 0] && (GtQ[p, 0] || LtQ[m, -1
])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{189c+189dx}\,dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{(2Bn)\int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)}{}}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{(a+bx)}}{189d}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{(2B(bc-ad)n)\int \frac{\left(A+B\log\left(e\right.\right.}{}}{189}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{(2B(bc-ad)n)\int\left(\frac{d\left(-A-B\right.}{}\right.}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{1}{189}(2Bn)\int\frac{\left(-A-B\log\right.}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{1}{189}(2Bn)\int\left(\frac{A\log(189c+}{-c-}\right.$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{1}{189}(2ABn)\int\frac{\log(189c+1}{-c-d}$$

$$= -\frac{2ABn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(189c+189dx)}{189d} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(}{189d}$$

$$= -\frac{2ABn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(189c+189dx)}{189d} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(}{189d}$$

$$= -\frac{B^2\log^2\left((a+bx)^n\right)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{2B^2n\,\mathrm{l}}{}$$

$$= -\frac{B^2\log^2\left((a+bx)^n\right)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} + \frac{B^2\log^2}{}$$

$$= -\frac{B^2\log^2\left((a+bx)^n\right)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{B^2n^2\,\mathrm{l}}{}$$

$$= -\frac{B^2\log^2\left((a+bx)^n\right)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{B^2n^2\,\mathrm{l}}{}$$

$$= -\frac{B^2\log^2\left((a+bx)^n\right)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{B^2n^2\,\mathrm{l}}{}$$

$$= -\frac{B^2\log^2\left((a+bx)^n\right)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{B^2n^2\,\mathrm{l}}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 306 vs. 2(137) = 274.
time = 0.12, size = 306, normalized size = 2.23

$$\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-Bn\log\left(\frac{a+bx}{c+dx}\right)\right)^2\log(c+dx)-Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-Bn\log\left(\frac{a+bx}{c+dx}\right)\right)\left(\log^2\left(\frac{c}{d}+x\right)+2\left(\log\left(\frac{a}{b}+x\right)-\log\left(\frac{c}{d}+x\right)-\log\left(\frac{a+bx}{c+dx}\right)\right)\log(c+dx)-2\left(\log\left(\frac{a}{b}+x\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)+\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)\right)-B^2n^2\left(\log^2\left(\frac{a+bx}{c+dx}\right)\log\left(\frac{bc-ad}{bc+bdx}\right)+2\log\left(\frac{a+bx}{c+dx}\right)\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)-2\text{Li}_3\left(\frac{d(a+bx)}{b(c+dx)}\right)\right)}{di}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x),x]
```

```
[Out] ((A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*Lo
g[c + d*x] - B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/
(c + d*x)])*(Log[c/d + x]^2 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x
)/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)]
 + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) - B^2*n^2*(Log[(a + b*x)/(c +
 d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*Log[(a + b*x)/(c + d*x)]*PolyLo
g[2, (d*(a + b*x))/(b*(c + d*x))] - 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x)
)]))/(d*i)
```

Maple [F]
time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="maxi
ma")
```

```
[Out] -I*B^2*log(d*x + c)*log((d*x + c)^n)^2/d - I*A^2*log(I*d*x + I*c)/d + integ
rate((-I*B^2*log((b*x + a)^n)^2 - 2*I*A*B - I*B^2 - 2*(I*A*B + I*B^2)*log((
b*x + a)^n) - 2*(-I*B^2*n*log(d*x + c) - I*B^2*log((b*x + a)^n) - I*A*B - I
*B^2)*log((d*x + c)^n))/(d*x + c), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="fric
as")
```

```
[Out] integral((-I*B^2*n^2*log((b*x + a)/(d*x + c))^2 - 2*(I*A*B + I*B^2)*n*log((
b*x + a)/(d*x + c)) - I*A^2 - 2*I*A*B - I*B^2)/(d*x + c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^2}{c+dx}\,dx + \int \frac{B^2 \log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx + \int \frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i),x)
```

```
[Out] (Integral(A**2/(c + d*x), x) + Integral(B**2*log(e*(a/(c + d*x) + b*x/(c +
d*x))**n)**2/(c + d*x), x) + Integral(2*A*B*log(e*(a/(c + d*x) + b*x/(c + d
*x))**n)/(c + d*x), x))/i
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="giac
")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(I*d*x + I*c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{c\,i+d\,i\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*i + d*i*x),x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*i + d*i*x), x)
```

3.190 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)}\,dx$

Optimal. Leaf size=50

$$\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}{3B(bc-ad)gin}$$

```
[Out] 1/3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3/B/(-a*d+b*c)/g/i/n
```

Rubi [A]

time = 0.11, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {2561, 2339, 30}

$$\frac{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bgin(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*i*x)),
x]
```

```
[Out] (A + B*Log[e*((a + b*x)/(c + d*x))^n])^3/(3*B*(b*c - a*d)*g*i*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(190c+190dx)(ag+bgx)}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g(c+dx)}\right) dx$$

$$= \frac{b\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{190(bc-ad)g} - \frac{d\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{190(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+\cdots}{190(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+\cdots}{190(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+\cdots}{190(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+\cdots}{190(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+\cdots}{190(bc-ad)g}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g}$$

$$= -\frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} + \cdots$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+b\cdots}{190(\cdots}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+b\cdots}{190(\cdots}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+b\cdots}{190(\cdots}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+b\cdots}{190(\cdots}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+b\cdots}{190(\cdots}$$

$$ABn\log^2(a+bx) \quad B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \quad B^2\log(a+b\cdots$$

Mathematica [**A**]
time = 0.14, size = 90, normalized size = 1.80

$$\frac{3A^2 \log \left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + 3AB \log^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + B^2 \log^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3bcgin - 3adgin}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*
i*x)),x]
```

```
[Out] (3*A^2*Log[e*((a + b*x)/(c + d*x))^n] + 3*A*B*Log[e*((a + b*x)/(c + d*x))^n
]^2 + B^2*Log[e*((a + b*x)/(c + d*x))^n]^3)/(3*b*c*g*i*n - 3*a*d*g*i*n)
```

Maple [**F**]
time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{\left(A + B \ln \left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx + ag)(dix + ci)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 403 vs. 2(46) = 92.
time = 0.30, size = 403, normalized size = 8.06

$$-B^2\left(\frac{\log(bx+a)}{(-ibc+iad)g} - \frac{\log(dx+c)}{(-ibc+iad)g}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)^2 - 2AB\left(\frac{\log(bx+a)}{(-ibc+iad)g} - \frac{\log(dx+c)}{(-ibc+iad)g}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right) + \frac{1}{3}\left(\frac{(-i\log(bx+a)^3 + 3i\log(bx+a)^2\log(dx+c) - 3i\log(bx+a)\log(dx+c)^2 + i\log(dx+c)^3)n^2}{bcg-adg} + \frac{3(i\log(bx+a)^2 - 2i\log(bx+a)\log(dx+c) + i\log(dx+c)^2)n\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)}{bcg-adg}\right)B^2 + \frac{(i\log(bx+a)^2 - 2i\log(bx+a)\log(dx+c) + i\log(dx+c)^2)ABn}{bcg-adg} - A^2\left(\frac{\log(bx+a)}{(-ibc+iad)g} - \frac{\log(dx+c)}{(-ibc+iad)g}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] -B^2*(log(b*x + a)/((-I*b*c + I*a*d)*g) - log(d*x + c)/((-I*b*c + I*a*d)*g)
)*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2 - 2*A*B*(log(b*x + a)/((-I*b*c +
 I*a*d)*g) - log(d*x + c)/((-I*b*c + I*a*d)*g))*log((b*x/(d*x + c) + a/(d*x
 + c))^n*e) + 1/3*((-I*log(b*x + a)^3 + 3*I*log(b*x + a)^2*log(d*x + c) - 3
*I*log(b*x + a)*log(d*x + c)^2 + I*log(d*x + c)^3)*n^2/(b*c*g - a*d*g) + 3*
(I*log(b*x + a)^2 - 2*I*log(b*x + a)*log(d*x + c) + I*log(d*x + c)^2)*n*log
((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b*c*g - a*d*g))*B^2 + (I*log(b*x + a)^
2 - 2*I*log(b*x + a)*log(d*x + c) + I*log(d*x + c)^2)*A*B*n/(b*c*g - a*d*g)
 - A^2*(log(b*x + a)/((-I*b*c + I*a*d)*g) - log(d*x + c)/((-I*b*c + I*a*d)*
g))
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 100 vs. 2(46) = 92.
time = 0.36, size = 100, normalized size = 2.00

$$-\frac{i\,B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^3-3\left(-i\,AB-i\,B^2\right)n\log\left(\frac{bx+a}{dx+c}\right)^2-3\left(-i\,A^2-2i\,AB-i\,B^2\right)\log\left(\frac{bx+a}{dx+c}\right)}{3\left(bc-ad\right)g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] -1/3*(I*B^2*n^2*log((b*x + a)/(d*x + c))^3 - 3*(-I*A*B - I*B^2)*n*log((b*x
+ a)/(d*x + c))^2 - 3*(-I*A^2 - 2*I*A*B - I*B^2)*log((b*x + a)/(d*x + c)))/
((b*c - a*d)*g)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{A^2}{ac+adx+bcx+bdx^2}\,dx+\int\frac{B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{ac+adx+bcx+bdx^2}\,dx+\int\frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{ac+adx+bcx+bdx^2}\,dx}{gi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] (Integral(A**2/(a*c + a*d*x + b*c*x + b*d*x**2), x) + Integral(B**2*log(e*(
a/(c + d*x) + b*x/(c + d*x))**n)**2/(a*c + a*d*x + b*c*x + b*d*x**2), x) +
Integral(2*A*B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a*c + a*d*x + b*c*x
 + b*d*x**2), x))/(g*i)
```

Giac [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 157 vs. 2(46) = 92.
time = 4.29, size = 157, normalized size = 3.14

$$-\frac{\left(i\,B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^3+3i\,ABn\log\left(\frac{bx+a}{dx+c}\right)^2+3i\,B^2n\log\left(\frac{bx+a}{dx+c}\right)^2+3i\,A^2\log\left(\frac{bx+a}{dx+c}\right)+6i\,AB\log\left(\frac{bx+a}{dx+c}\right)+3i\,B^2\log\left(\frac{bx+a}{dx+c}\right)\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)}{3\,g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] -1/3*(I*B^2*n^2*log((b*x + a)/(d*x + c))^3 + 3*I*A*B*n*log((b*x + a)/(d*x +
 c))^2 + 3*I*B^2*n*log((b*x + a)/(d*x + c))^2 + 3*I*A^2*log((b*x + a)/(d*x
+ c)) + 6*I*A*B*log((b*x + a)/(d*x + c)) + 3*I*B^2*log((b*x + a)/(d*x + c))
)*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)/g
```

Mupad [B]
time = 5.68, size = 122, normalized size = 2.44

$$-\frac{\frac{B^2\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^3}{3}+A\,B\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^2}{g\,i\,n\,\left(a\,d-b\,c\right)}+\frac{A^2\,\mathrm{atan}\left(\frac{a\,d\,1\mathrm{i}+b\,c\,1\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}\right)\,2\mathrm{i}}{g\,i\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)*(c*i + d*i*x)),
x)
```

```
[Out] (A^2*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(g*i*(a*d - b*c)) -
 ((B^2*log(e*((a + b*x)/(c + d*x))^n)^3)/3 + A*B*log(e*((a + b*x)/(c + d*x)
)^n)^2)/(g*i*n*(a*d - b*c))
```

3.191 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)}\,dx$

Optimal. Leaf size=199

$$-\frac{2bB^2n^2(c+dx)}{(bc-ad)^2g^2i(a+bx)}-\frac{2bBn(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^2g^2i(a+bx)}-\frac{b(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(bc-ad)^2g^2i(a+bx)}-\frac{d(A+\ldots}{3\ldots}$$

```
[Out] -2*b*B^2*n^2*(d*x+c)/(-a*d+b*c)^2/g^2/i/(b*x+a)-2*b*B*n*(d*x+c)*(A+B*ln(e*(
(b*x+a)/(d*x+c))^n))/(-a*d+b*c)^2/g^2/i/(b*x+a)-b*(d*x+c)*(A+B*ln(e*((b*x+a
)/(d*x+c))^n))^2/(-a*d+b*c)^2/g^2/i/(b*x+a)-1/3*d*(A+B*ln(e*((b*x+a)/(d*x+c
))^n))^3/B/(-a*d+b*c)^2/g^2/i/n
```

Rubi [A]
time = 0.20, antiderivative size = 199, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2561, 2395, 2342, 2341, 2339, 30}

$$-\frac{d\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bg^2in(bc-ad)^2}-\frac{b(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2i(a+bx)(bc-ad)^2}-\frac{2bBn(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i(a+bx)(bc-ad)^2}-\frac{2bB^2n^2(c+dx)}{g^2i(a+bx)(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i + d*i*x)
),x]
```

```
[Out] (-2*b*B^2*n^2*(c + d*x))/((b*c - a*d)^2*g^2*i*(a + b*x)) - (2*b*B*n*(c + d*
x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^2*i*(a + b*x))
- (b*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g^2
*i*(a + b*x)) - (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*
d)^2*g^2*i*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
```

```
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(191c+191dx)(ag+bgx)^2}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)^2} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2(a+bx)} + \frac{d^2\left(A+\right.}{191(bc\right.}$$

$$= -\frac{(bd)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{191(bc-ad)^2g^2} + \frac{d^2\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{191(bc-ad)^2g^2} + \frac{b\int \frac{\left(A+\right.}{}}{19}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2} + \frac{d}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2} + \frac{d}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2} + \frac{d}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2} + \frac{d}{}$$

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc-ad)g^2(a+bx)} - \frac{2Bdn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{191(bc-ad)^2g^2}$$

$$= \frac{B^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc-ad)^2g^2} - \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc-ad)g^2(a+bx)} - \frac{2Bdn}{}$$

$$= \frac{B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc-ad)^2g^2} + \frac{B^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc-ad)^2g^2} -$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} -$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} -$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} -$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} -$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} -$$

Mathematica [**B**] Leaf count is larger than twice the leaf count of optimal. 793 vs. 2(199) = 398.
time = 0.45, size = 793, normalized size = 3.98

$$-\frac{B^2dn^2\log^3\left(\frac{a+bx}{c+dx}\right)}{3(bc-ad)^2g^2i}+\frac{2Bn\log\left(\frac{a+bx}{c+dx}\right)\left(A+Bn+B\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)\right)}{(-bc+ad)g^2i(a+bx)}+\frac{\log^2\left(\frac{a+bx}{c+dx}\right)\left(-aABdn-bB^2cn^2-AbBdnx-bB^2dn^2x-aB^2dn\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)-bB^2dnx\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)\right)}{(-bc+ad)^2g^2i(a+bx)}+\frac{-A^2-2ABn-2B^2n^2-2AB\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)-2B^2n\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)-B^2\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)^2}{(bc-ad)g^2i(a+bx)}-\frac{d\log(a+bx)\left(A^2+2ABn+2B^2n^2+2AB\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)+2B^2n\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)+B^2\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)^2\right)}{(bc-ad)^2g^2i}+\frac{d\left(A^2+2ABn+2B^2n^2+2AB\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)+2B^2n\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)+B^2\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)^2\right)\log(c+dx)}{(bc-ad)^2g^2i}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i +
d*i*x)),x]
```

```
[Out] -1/3*(B^2*d*n^2*Log[(a + b*x)/(c + d*x)]^3)/((b*c - a*d)^2*g^2*i) + (2*B*n*
Log[(a + b*x)/(c + d*x)]*(A + B*n + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*L
og[(a + b*x)/(c + d*x)])))/((-(b*c) + a*d)*g^2*i*(a + b*x)) + (Log[(a + b*x
)/(c + d*x)]^2*(-(a*A*B*d*n) - b*B^2*c*n^2 - A*b*B*d*n*x - b*B^2*d*n^2*x -
a*B^2*d*n*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - b
*B^2*d*n*x*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])))/
((-(b*c) + a*d)^2*g^2*i*(a + b*x)) + (-A^2 - 2*A*B*n - 2*B^2*n^2 - 2*A*B*(L
og[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - 2*B^2*n*(Log[
e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - B^2*(Log[e*((a +
 b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)/((b*c - a*d)*g^2*i*(a
+ b*x)) - (d*Log[a + b*x]*(A^2 + 2*A*B*n + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b
*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) + 2*B^2*n*(Log[e*((a + b*x)
/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d
*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2))/((b*c - a*d)^2*g^2*i) + (d*(A^2 +
 2*A*B*n + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b
*x)/(c + d*x)]) + 2*B^2*n*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)
/(c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d
*x)])^2)*Log[c + d*x])/((b*c - a*d)^2*g^2*i)
```

Maple [**F**]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{(bgx+ag)^{2}(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1028 vs. 2(188) = 376.
time = 0.45, size = 1028, normalized size = 5.17

$$B^2\left(\frac{1}{(-ib^2c+iabd)g^2x+(-iabc+ia^2d)g^2}-\frac{d\log(bx+a)}{(ib^2c^2-2iabcd+ia^2d^2)g^2}+\frac{d\log(dx+c)}{(ib^2c^2-2iabcd+ia^2d^2)g^2}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)^2+2AB\left(\frac{1}{(-ib^2c+iabd)g^2x+(-iabc+ia^2d)g^2}-\frac{d\log(bx+a)}{(ib^2c^2-2iabcd+ia^2d^2)g^2}+\frac{d\log(dx+c)}{(ib^2c^2-2iabcd+ia^2d^2)g^2}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n e\right)-\frac{1}{3}\left(\text{[illegible]}\right)$$ [illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] B^2*(1/((-I*b^2*c + I*a*b*d)*g^2*x + (-I*a*b*c + I*a^2*d)*g^2) - d*log(b*x
+ a)/((I*b^2*c^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2) + d*log(d*x + c)/((I*b^2*c
^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2))*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^
2 + 2*A*B*(1/((-I*b^2*c + I*a*b*d)*g^2*x + (-I*a*b*c + I*a^2*d)*g^2) - d*lo
g(b*x + a)/((I*b^2*c^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2) + d*log(d*x + c)/((I
*b^2*c^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2))*log((b*x/(d*x + c) + a/(d*x + c))
^n*e) - 1/3*(((-I*b*d*x - I*a*d)*log(b*x + a)^3 + (I*b*d*x + I*a*d)*log(d*x
 + c)^3 - 3*(-I*b*d*x - I*a*d)*log(b*x + a)^2 - 3*(-I*b*d*x - I*a*d + (I*b*
d*x + I*a*d)*log(b*x + a))*log(d*x + c)^2 - 6*I*b*c + 6*I*a*d - 6*(I*b*d*x
+ I*a*d)*log(b*x + a) - 3*(-2*I*b*d*x + (-I*b*d*x - I*a*d)*log(b*x + a)^2 -
 2*I*a*d + 2*(I*b*d*x + I*a*d)*log(b*x + a))*log(d*x + c))*n^2/(a*b^2*c^2*g
^2 - 2*a^2*b*c*d*g^2 + a^3*d^2*g^2 + (b^3*c^2*g^2 - 2*a*b^2*c*d*g^2 + a^2*b
*d^2*g^2)*x) + 3*((I*b*d*x + I*a*d)*log(b*x + a)^2 + (I*b*d*x + I*a*d)*log(
d*x + c)^2 - 2*I*b*c + 2*I*a*d - 2*(I*b*d*x + I*a*d)*log(b*x + a) - 2*(-I*b
*d*x - I*a*d + (I*b*d*x + I*a*d)*log(b*x + a))*log(d*x + c))*n*log((b*x/(d*
x + c) + a/(d*x + c))^n*e)/(a*b^2*c^2*g^2 - 2*a^2*b*c*d*g^2 + a^3*d^2*g^2 +
 (b^3*c^2*g^2 - 2*a*b^2*c*d*g^2 + a^2*b*d^2*g^2)*x))*B^2 - ((I*b*d*x + I*a*
d)*log(b*x + a)^2 + (I*b*d*x + I*a*d)*log(d*x + c)^2 - 2*I*b*c + 2*I*a*d -
2*(I*b*d*x + I*a*d)*log(b*x + a) - 2*(-I*b*d*x - I*a*d + (I*b*d*x + I*a*d)*
log(b*x + a))*log(d*x + c))*A*B*n/(a*b^2*c^2*g^2 - 2*a^2*b*c*d*g^2 + a^3*d^
2*g^2 + (b^3*c^2*g^2 - 2*a*b^2*c*d*g^2 + a^2*b*d^2*g^2)*x) + A^2*(1/((-I*b^
2*c + I*a*b*d)*g^2*x + (-I*a*b*c + I*a^2*d)*g^2) - d*log(b*x + a)/((I*b^2*c
^2 - 2*I*a*b*c*d + I*a^2*d^2)*g^2) + d*log(d*x + c)/((I*b^2*c^2 - 2*I*a*b*c
*d + I*a^2*d^2)*g^2))
```

<u>Fricas</u> [**A**]
time = 0.40, size = 366, normalized size = 1.84

$$\frac{\left(i\,B^{2}bdn^{2}x+i\,B^{2}adn^{2}\right)\log\left(\frac{bx+a}{dx+c}\right)^{3}-3\left(-i\,A^{2}-2i\,AB-i\,B^{2}\right)bc-3\left(i\,A^{2}+2i\,AB+i\,B^{2}\right)ad-6\left(-i\,B^{2}bc+i\,B^{2}ad\right)n^{2}-3\left(-i\,B^{2}bcn^{2}+\left(-i\,AB-i\,B^{2}\right)adn+\left(-i\,B^{2}bdn^{2}+\left(-i\,AB-i\,B^{2}\right)bdn\right)x\right)\log\left(\frac{bx+a}{dx+c}\right)^{2}-6\left(\left(-i\,AB-i\,B^{2}\right)bc+\left(i\,AB+i\,B^{2}\right)ad\right)n-3\left(-2i\,B^{2}bcn^{2}+2\left(-i\,AB-i\,B^{2}\right)bcn+\left(-i\,A^{2}-2i\,AB-i\,B^{2}\right)ad+\left(-2i\,B^{2}bdn^{2}+2\left(-i\,AB-i\,B^{2}\right)bdn+\left(-i\,A^{2}-2i\,AB-i\,B^{2}\right)bd\right)x\right)\log\left(\frac{bx+a}{dx+c}\right)}{3\left(\left(b^{3}c^{2}-2\,ab^{2}cd+a^{2}bd^{2}\right)g^{2}x+\left(ab^{2}c^{2}-2\,a^{2}bcd+a^{3}d^{2}\right)g^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] 1/3*((I*B^2*b*d*n^2*x + I*B^2*a*d*n^2)*log((b*x + a)/(d*x + c))^3 - 3*(-I*A
^2 - 2*I*A*B - I*B^2)*b*c - 3*(I*A^2 + 2*I*A*B + I*B^2)*a*d - 6*(-I*B^2*b*c
 + I*B^2*a*d)*n^2 - 3*(-I*B^2*b*c*n^2 + (-I*A*B - I*B^2)*a*d*n + (-I*B^2*b*
d*n^2 + (-I*A*B - I*B^2)*b*d*n)*x)*log((b*x + a)/(d*x + c))^2 - 6*((-I*A*B
- I*B^2)*b*c + (I*A*B + I*B^2)*a*d)*n - 3*(-2*I*B^2*b*c*n^2 + 2*(-I*A*B - I
*B^2)*b*c*n + (-I*A^2 - 2*I*A*B - I*B^2)*a*d + (-2*I*B^2*b*d*n^2 + 2*(-I*A*
B - I*B^2)*b*d*n + (-I*A^2 - 2*I*A*B - I*B^2)*b*d)*x)*log((b*x + a)/(d*x +
```

```
c)))/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^2*x + (a*b^2*c^2 - 2*a^2*b*c*d
+ a^3*d^2)*g^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2/(d*i*x+c*i),x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, a
lgorithm="giac")
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/((b*g*x + a*g)^2*(I*d*x
+ I*c)), x)
```

Mupad [**B**]
time = 5.85, size = 361, normalized size = 1.81

$$\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^2\left(\frac{B^2}{\left(a\,d-b\,c\right)\,\left(a\,g^2\,i+b\,g^2\,i\,x\right)}-\frac{B\,d\,\left(A+B\,n\right)}{g^2\,i\,n\,{\left(a\,d-b\,c\right)}^2}\right)+\frac{A^2+2\,A\,B\,n+2\,B^2\,n^2}{\left(a\,d-b\,c\right)\,\left(a\,g^2\,i+b\,g^2\,i\,x\right)}+\frac{2\,B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,\left(A+B\,n\right)}{\left(a\,d-b\,c\right)\,\left(a\,g^2\,i+b\,g^2\,i\,x\right)}-\frac{B^2\,d\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)^3}{3\,g^2\,i\,n\,{\left(a\,d-b\,c\right)}^2}+\frac{d\,\mathrm{atan}\left(\frac{d\,\left(2\,b\,d\,x+\frac{a^2\,d^2\,g^2\,i-b^2\,c^2\,g^2\,i}{g^2\,i\,\left(a\,d-b\,c\right)}\right)\,\left(A^2+2\,A\,B\,n+2\,B^2\,n^2\right)\,1{}\mathrm{i}}{\left(a\,d-b\,c\right)\,\left(d\,A^2+2\,d\,A\,B\,n+2\,d\,B^2\,n^2\right)}\right)\,\left(A^2+2\,A\,B\,n+2\,B^2\,n^2\right)\,2{}\mathrm{i}}{g^2\,i\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^2*(c*i + d*i*x)
),x)
[Out] log(e*((a + b*x)/(c + d*x))^n)^2*(B^2/((a*d - b*c)*(a*g^2*i + b*g^2*i*x)) -
 (B*d*(A + B*n))/(g^2*i*n*(a*d - b*c)^2)) + (A^2 + 2*B^2*n^2 + 2*A*B*n)/((a
*d - b*c)*(a*g^2*i + b*g^2*i*x)) + (2*B*log(e*((a + b*x)/(c + d*x))^n)*(A +
 B*n))/((a*d - b*c)*(a*g^2*i + b*g^2*i*x)) + (d*atan((d*(2*b*d*x + (a^2*d^2
*g^2*i - b^2*c^2*g^2*i)/(g^2*i*(a*d - b*c)))*(A^2 + 2*B^2*n^2 + 2*A*B*n)*1i
)/((a*d - b*c)*(A^2*d + 2*B^2*d*n^2 + 2*A*B*d*n)))*(A^2 + 2*B^2*n^2 + 2*A*B
*n)*2i)/(g^2*i*(a*d - b*c)^2) - (B^2*d*log(e*((a + b*x)/(c + d*x))^n)^3)/(3
*g^2*i*n*(a*d - b*c)^2)
```

3.192 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)}\,dx$

Optimal. Leaf size=369

$$\frac{4bB^2dn^2(c+dx)}{(bc-ad)^3g^3i(a+bx)}-\frac{b^2B^2n^2(c+dx)^2}{4(bc-ad)^3g^3i(a+bx)^2}+\frac{4bBdn(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^3g^3i(a+bx)}-\frac{b^2Bn(c+dx)^2\,(A}{2(bc-ad}$$

```
[Out] 4*b*B^2*d*n^2*(d*x+c)/(-a*d+b*c)^3/g^3/i/(b*x+a)-1/4*b^2*B^2*n^2*(d*x+c)^2/
(-a*d+b*c)^3/g^3/i/(b*x+a)^2+4*b*B*d*n*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^
n))/(-a*d+b*c)^3/g^3/i/(b*x+a)-1/2*b^2*B*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*
x+c))^n))/(-a*d+b*c)^3/g^3/i/(b*x+a)^2+2*b*d*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*
x+c))^n))^2/(-a*d+b*c)^3/g^3/i/(b*x+a)-1/2*b^2*(d*x+c)^2*(A+B*ln(e*((b*x+a)
/(d*x+c))^n))^2/(-a*d+b*c)^3/g^3/i/(b*x+a)^2+1/3*d^2*(A+B*ln(e*((b*x+a)/(d*
x+c))^n))^3/B/(-a*d+b*c)^3/g^3/i/n
```

Rubi [A]
time = 0.28, antiderivative size = 369, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2561, 2395, 2342, 2341, 2339, 30}

$$-\frac{b^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3i(a+bx)^2(bc-ad)^3}-\frac{b^2Bn(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i(a+bx)^2(bc-ad)^3}+\frac{d^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bg^3in(bc-ad)^3}+\frac{2bd(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^3i(a+bx)(bc-ad)^3}+\frac{4bBdn(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(a+bx)(bc-ad)^3}-\frac{b^2B^2n^2(c+dx)^2}{4g^3i(a+bx)^2(bc-ad)^3}+\frac{4bB^2dn^2(c+dx)}{g^3i(a+bx)(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i + d*i*x)
),x]
```

```
[Out] (4*b*B^2*d*n^2*(c + d*x))/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*B^2*n^2*(c
 + d*x)^2)/(4*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (4*b*B*d*n*(c + d*x)*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*B
*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g^3
*i*(a + b*x)^2) + (2*b*d*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
)/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*(c + d*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])^2)/(2*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (d^2*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^3*g^3*i*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
```

x]

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(192c+192dx)(ag+bgx)^3}\,dx=\int\left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)g^3(a+bx)^3}-\frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)^2}+\frac{bd^2(A+\cdots}{192(bc\cdots}$$

$$=\frac{(bd^2)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{192(bc-ad)^3g^3}-\frac{d^3\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{192(bc-ad)^3g^3}-\frac{(bd)\int\cdots}{19\cdots}$$

$$=-\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc-ad)g^3(a+bx)^2}+\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)}+\frac{d^2\log(a+bx\cdots}{19\cdots}$$

$$=-\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc-ad)g^3(a+bx)^2}+\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)}+\frac{d^2\log(a+bx\cdots}{19\cdots}$$

$$=-\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc-ad)g^3(a+bx)^2}+\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)}+\frac{d^2\log(a+bx\cdots}{19\cdots}$$

$$=-\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc-ad)g^3(a+bx)^2}+\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)}+\frac{d^2\log(a+bx\cdots}{19\cdots}$$

$$=-\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{384(bc-ad)g^3(a+bx)^2}+\frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{64(bc-ad)^2g^3(a+bx)}+\frac{Bd^2n\log\cdots}{\cdots}$$

$$=-\frac{B^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{192(bc-ad)^3g^3}-\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{384(bc-ad)g^3(a+bx)^2}+\frac{Bdn\cdots}{6\cdots}$$

$$=-\frac{B^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{192(bc-ad)^3g^3}-\frac{B^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^{\cdots}\right.}{192(bc-ad)^3g^3}$$

$$=-\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2}+\frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)}+\frac{7B^2d^2n^2\log(a\cdots}{384(bc-ad)\cdots}$$

$$=-\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2}+\frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)}+\frac{7B^2d^2n^2\log(a\cdots}{384(bc-ad)\cdots}$$

$$=-\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2}+\frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)}+\frac{7B^2d^2n^2\log(a\cdots}{384(bc-ad)\cdots}$$

$$=-\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2}+\frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)}+\frac{7B^2d^2n^2\log(a\cdots}{384(bc-ad)\cdots}$$

$$=-\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2}+\frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)}+\frac{7B^2d^2n^2\log(a\cdots}{384(bc-ad)\cdots}$$

Mathematica [**B**] Leaf count is larger than twice the leaf count of optimal. 975 vs. 2(369) = 738.
time = 0.80, size = 975, normalized size = 2.64

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i +
d*i*x)),x]
```

```
[Out] (4*B^2*d^2*n^2*(a + b*x)^2*Log[(a + b*x)/(c + d*x)]^3 + 6*B*n*Log[(a + b*x)
/(c + d*x)]^2*(2*a^2*A*d^2 - b^2*B*c^2*n + 4*a*b*B*c*d*n + 4*a*A*b*d^2*x +
2*b^2*B*c*d*n*x + 4*a*b*B*d^2*n*x + 2*A*b^2*d^2*x^2 + 3*b^2*B*d^2*n*x^2 + 2
*B*d^2*(a + b*x)^2*Log[e*((a + b*x)/(c + d*x))^n] - 2*B*d^2*n*(a + b*x)^2*L
og[(a + b*x)/(c + d*x)]) - 6*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d*x)]*(2*A*
b*c - 6*a*A*d + b*B*c*n - 7*a*B*d*n - 4*A*b*d*x - 6*b*B*d*n*x + 2*B*(-3*a*d
 + b*(c - 2*d*x))*Log[e*((a + b*x)/(c + d*x))^n] + 2*B*n*(-(b*c) + 3*a*d +
2*b*d*x)*Log[(a + b*x)/(c + d*x)]) - 3*(b*c - a*d)^2*(2*A^2 + 2*A*B*n + B^2
*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log[(a +
b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*
x)/(c + d*x))^n]*(2*A + B*n - 2*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d*(b*c -
 a*d)*(a + b*x)*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c +
d*x))^n]^2 - 2*B*n*(2*A + 3*B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(
a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A + 3*B*n - 2
*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d^2*(a + b*x)^2*Log[a + b*x]*(2*A^2 + 6
*A*B*n + 7*B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A +
3*B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*
B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A + 3*B*n - 2*B*n*Log[(a + b*x)/(c + d*
x)])) - 6*d^2*(a + b*x)^2*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B^2*Log[e*((a +
b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + 3*B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2
*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A +
 3*B*n - 2*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c + d*x])/(12*(b*c - a*d)^3*g
^3*i*(a + b*x)^2)
```

Maple [**F**]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(bgx+ag\right)^{3}\left(dix+ci\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2126 vs. 2(345) = 690.
time = 0.66, size = 2126, normalized size = 5.76

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] -1/2*B^2*((2*b*d*x - b*c + 3*a*d)/((-I*b^4*c^2 + 2*I*a*b^3*c*d - I*a^2*b^2*
d^2)*g^3*x^2 + 2*(-I*a*b^3*c^2 + 2*I*a^2*b^2*c*d - I*a^3*b*d^2)*g^3*x + (-I
*a^2*b^2*c^2 + 2*I*a^3*b*c*d - I*a^4*d^2)*g^3) + 2*d^2*log(b*x + a)/((-I*b^
3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3) - 2*d^2*log(d*x
 + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3))*l
og((b*x/(d*x + c) + a/(d*x + c))^n*e)^2 - A*B*((2*b*d*x - b*c + 3*a*d)/((-I
*b^4*c^2 + 2*I*a*b^3*c*d - I*a^2*b^2*d^2)*g^3*x^2 + 2*(-I*a*b^3*c^2 + 2*I*a
^2*b^2*c*d - I*a^3*b*d^2)*g^3*x + (-I*a^2*b^2*c^2 + 2*I*a^3*b*c*d - I*a^4*d
^2)*g^3) + 2*d^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*
d^2 + I*a^3*d^3)*g^3) - 2*d^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d -
 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g^3))*log((b*x/(d*x + c) + a/(d*x + c))^n*e)
+ 1/12*((3*I*b^2*c^2 - 48*I*a*b*c*d + 45*I*a^2*d^2 - 4*(I*b^2*d^2*x^2 + 2*I
*a*b*d^2*x + I*a^2*d^2)*log(b*x + a)^3 - 4*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x
- I*a^2*d^2)*log(d*x + c)^3 - 18*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^
2)*log(b*x + a)^2 - 6*(-3*I*b^2*d^2*x^2 - 6*I*a*b*d^2*x - 3*I*a^2*d^2 + 2*(
I*b^2*d^2*x^2 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x + a))*log(d*x + c)^2 - 4
2*(I*b^2*c*d - I*a*b*d^2)*x - 42*(I*b^2*d^2*x^2 + 2*I*a*b*d^2*x + I*a^2*d^2
)*log(b*x + a) - 6*(-7*I*b^2*d^2*x^2 - 14*I*a*b*d^2*x - 7*I*a^2*d^2 + 2*(-I
*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^2)*log(b*x + a)^2 + 6*(I*b^2*d^2*x^2
 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x + a))*log(d*x + c))*n^2/(a^2*b^3*c^3*
g^3 - 3*a^3*b^2*c^2*d*g^3 + 3*a^4*b*c*d^2*g^3 - a^5*d^3*g^3 + (b^5*c^3*g^3
- 3*a*b^4*c^2*d*g^3 + 3*a^2*b^3*c*d^2*g^3 - a^3*b^2*d^3*g^3)*x^2 + 2*(a*b^4
*c^3*g^3 - 3*a^2*b^3*c^2*d*g^3 + 3*a^3*b^2*c*d^2*g^3 - a^4*b*d^3*g^3)*x) +
6*(I*b^2*c^2 - 8*I*a*b*c*d + 7*I*a^2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*
x - I*a^2*d^2)*log(b*x + a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d
^2)*log(d*x + c)^2 - 6*(I*b^2*c*d - I*a*b*d^2)*x - 6*(I*b^2*d^2*x^2 + 2*I*a
*b*d^2*x + I*a^2*d^2)*log(b*x + a) - 2*(-3*I*b^2*d^2*x^2 - 6*I*a*b*d^2*x -
3*I*a^2*d^2 + 2*(I*b^2*d^2*x^2 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x + a))*l
og(d*x + c))*n*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(a^2*b^3*c^3*g^3 - 3*
a^3*b^2*c^2*d*g^3 + 3*a^4*b*c*d^2*g^3 - a^5*d^3*g^3 + (b^5*c^3*g^3 - 3*a*b^
4*c^2*d*g^3 + 3*a^2*b^3*c*d^2*g^3 - a^3*b^2*d^3*g^3)*x^2 + 2*(a*b^4*c^3*g^3
 - 3*a^2*b^3*c^2*d*g^3 + 3*a^3*b^2*c*d^2*g^3 - a^4*b*d^3*g^3)*x))*B^2 + 1/2
*(I*b^2*c^2 - 8*I*a*b*c*d + 7*I*a^2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x
 - I*a^2*d^2)*log(b*x + a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*a*b*d^2*x - I*a^2*d^
2)*log(d*x + c)^2 - 6*(I*b^2*c*d - I*a*b*d^2)*x - 6*(I*b^2*d^2*x^2 + 2*I*a*
```

```
b*d^2*x + I*a^2*d^2)*log(b*x + a) - 2*(-3*I*b^2*d^2*x^2 - 6*I*a*b*d^2*x - 3
*I*a^2*d^2 + 2*(I*b^2*d^2*x^2 + 2*I*a*b*d^2*x + I*a^2*d^2)*log(b*x + a))*lo
g(d*x + c))*A*B*n/(a^2*b^3*c^3*g^3 - 3*a^3*b^2*c^2*d*g^3 + 3*a^4*b*c*d^2*g^
3 - a^5*d^3*g^3 + (b^5*c^3*g^3 - 3*a*b^4*c^2*d*g^3 + 3*a^2*b^3*c*d^2*g^3 -
a^3*b^2*d^3*g^3)*x^2 + 2*(a*b^4*c^3*g^3 - 3*a^2*b^3*c^2*d*g^3 + 3*a^3*b^2*c
*d^2*g^3 - a^4*b*d^3*g^3)*x) - 1/2*A^2*((2*b*d*x - b*c + 3*a*d)/((-I*b^4*c^
2 + 2*I*a*b^3*c*d - I*a^2*b^2*d^2)*g^3*x^2 + 2*(-I*a*b^3*c^2 + 2*I*a^2*b^2*
c*d - I*a^3*b*d^2)*g^3*x + (-I*a^2*b^2*c^2 + 2*I*a^3*b*c*d - I*a^4*d^2)*g^3
) + 2*d^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I
*a^3*d^3)*g^3) - 2*d^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^
2*b*c*d^2 + I*a^3*d^3)*g^3))
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 879 vs. $2(345) = 690$.
time = 0.42, size = 879, normalized size = 2.38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] 1/12*(6*(I*A^2 + 2*I*A*B + I*B^2)*b^2*c^2 + 24*(-I*A^2 - 2*I*A*B - I*B^2)*a
*b*c*d + 18*(I*A^2 + 2*I*A*B + I*B^2)*a^2*d^2 + 4*(-I*B^2*b^2*d^2*n^2*x^2 -
 2*I*B^2*a*b*d^2*n^2*x - I*B^2*a^2*d^2*n^2)*log((b*x + a)/(d*x + c))^3 + 3*
(I*B^2*b^2*c^2 - 16*I*B^2*a*b*c*d + 15*I*B^2*a^2*d^2)*n^2 + 6*(2*(-I*A*B -
I*B^2)*a^2*d^2*n + (I*B^2*b^2*c^2 - 4*I*B^2*a*b*c*d)*n^2 + (-3*I*B^2*b^2*d^
2*n^2 + 2*(-I*A*B - I*B^2)*b^2*d^2*n)*x^2 + 2*(2*(-I*A*B - I*B^2)*a*b*d^2*n
 + (-I*B^2*b^2*c*d - 2*I*B^2*a*b*d^2)*n^2)*x)*log((b*x + a)/(d*x + c))^2 +
6*((I*A*B + I*B^2)*b^2*c^2 + 8*(-I*A*B - I*B^2)*a*b*c*d + 7*(I*A*B + I*B^2)
*a^2*d^2)*n + 6*(2*(-I*A^2 - 2*I*A*B - I*B^2)*b^2*c*d + 2*(I*A^2 + 2*I*A*B
+ I*B^2)*a*b*d^2 + 7*(-I*B^2*b^2*c*d + I*B^2*a*b*d^2)*n^2 + 6*((-I*A*B - I*
B^2)*b^2*c*d + (I*A*B + I*B^2)*a*b*d^2)*n)*x + 6*(2*(-I*A^2 - 2*I*A*B - I*B
^2)*a^2*d^2 + (I*B^2*b^2*c^2 - 8*I*B^2*a*b*c*d)*n^2 + (-7*I*B^2*b^2*d^2*n^2
 + 6*(-I*A*B - I*B^2)*b^2*d^2*n + 2*(-I*A^2 - 2*I*A*B - I*B^2)*b^2*d^2)*x^2
 + 2*((I*A*B + I*B^2)*b^2*c^2 + 4*(-I*A*B - I*B^2)*a*b*c*d)*n + 2*(2*(-I*A^
2 - 2*I*A*B - I*B^2)*a*b*d^2 + (-3*I*B^2*b^2*c*d - 4*I*B^2*a*b*d^2)*n^2 + 2
*((-I*A*B - I*B^2)*b^2*c*d + 2*(-I*A*B - I*B^2)*a*b*d^2)*n)*x)*log((b*x + a
)/(d*x + c)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^
3*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^2 - a^4*b*d^3)*g^3*x
 + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 - a^5*d^3)*g^3)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [A]
time = 264.58, size = 179, normalized size = 0.49

$$-\frac{1}{4}\left(-\frac{2i\,(dx+c)^2B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^2}{(bx+a)^2g^3}+\frac{2\,(-i\,B^2n^2-2i\,ABn-2i\,B^2n)(dx+c)^2\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)^2g^3}+\frac{(-i\,B^2n^2-2i\,ABn-2i\,B^2n-2i\,A^2-4i\,AB-2i\,B^2)(dx+c)^2}{(bx+a)^2g^3}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] -1/4*(-2*I*(d*x + c)^2*B^2*n^2*log((b*x + a)/(d*x + c))^2/((b*x + a)^2*g^3)
 + 2*(-I*B^2*n^2 - 2*I*A*B*n - 2*I*B^2*n)*(d*x + c)^2*log((b*x + a)/(d*x +
c))/((b*x + a)^2*g^3) + (-I*B^2*n^2 - 2*I*A*B*n - 2*I*B^2*n - 2*I*A^2 - 4*I
*A*B - 2*I*B^2)*(d*x + c)^2/((b*x + a)^2*g^3))*(b*c/(b*c - a*d)^2 - a*d/(b*
c - a*d)^2)^2
```

Mupad [B]
time = 8.49, size = 1011, normalized size = 2.74

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^3*(c*i + d*i*x)
),x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)*((B^2*n)/(x^2*(b^3*c*g^3*i - a*b^2*d*g^3*i)
+ x*(2*a*b^2*c*g^3*i - 2*a^2*b*d*g^3*i) - a^3*d*g^3*i + a^2*b*c*g^3*i) - (d
^2*(3*B^2*n + 2*A*B)*((a*g^3*i*n*(a*d - b*c)^2)/(2*d) + (g^3*i*n*(a*d - b*c
)^2*(2*a*d - b*c))/(2*d^2) + (b*g^3*i*n*x*(a*d - b*c)^2)/d))/(g^3*i*n*(a*d
- b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(x^2*(b^3*c*g^3*i - a*b^2*d*g^3*i) +
 x*(2*a*b^2*c*g^3*i - 2*a^2*b*d*g^3*i) - a^3*d*g^3*i + a^2*b*c*g^3*i))) - l
og(e*((a + b*x)/(c + d*x))^n)^2*((d^2*(3*B^2*n + 2*A*B))/(2*g^3*i*n*(a*d -
b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) - (B^2*d^2*((g^3*i*n*(a*d - b*c)*(2*a
*d - b*c))/(2*d^2) + (a*g^3*i*n*(a*d - b*c))/(2*d) + (b*g^3*i*n*x*(a*d - b*
c))/d))/(g^3*i*n*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(a^2*g^3*i + b
^2*g^3*i*x^2 + 2*a*b*g^3*i*x))) - ((6*A^2*a*d - 2*A^2*b*c + 15*B^2*a*d*n^2
- B^2*b*c*n^2 + 14*A*B*a*d*n - 2*A*B*b*c*n)/(2*(a*d - b*c)) + (x*(2*A^2*b*d
 + 7*B^2*b*d*n^2 + 6*A*B*b*d*n))/(a*d - b*c))/(x^2*(2*b^3*c*g^3*i - 2*a*b^2
*d*g^3*i) + x*(4*a*b^2*c*g^3*i - 4*a^2*b*d*g^3*i) - 2*a^3*d*g^3*i + 2*a^2*b
*c*g^3*i) + (d^2*atan((d^2*((a^3*d^3*g^3*i + b^3*c^3*g^3*i - a*b^2*c^2*d*g^
3*i - a^2*b*c*d^2*g^3*i)/(a^2*d^2*g^3*i + b^2*c^2*g^3*i - 2*a*b*c*d*g^3*i)
```

```
+ 2*b*d*x)*(A^2 + (7*B^2*n^2)/2 + 3*A*B*n)*(a^2*d^2*g^3*i + b^2*c^2*g^3*i -
 2*a*b*c*d*g^3*i)*2i)/(g^3*i*(a*d - b*c)^3*(2*A^2*d^2 + 7*B^2*d^2*n^2 + 6*A
*B*d^2*n)))*(A^2 + (7*B^2*n^2)/2 + 3*A*B*n)*2i)/(g^3*i*(a*d - b*c)^3) - (B^
2*d^2*log(e*((a + b*x)/(c + d*x))^n)^3)/(3*g^3*i*n*(a*d - b*c)*(a^2*d^2 + b
^2*c^2 - 2*a*b*c*d))
```

3.193 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)}\,dx$

Optimal. Leaf size=543

$$-\frac{6bB^2d^2n^2(c+dx)}{(bc-ad)^4g^4i(a+bx)}+\frac{3b^2B^2dn^2(c+dx)^2}{4(bc-ad)^4g^4i(a+bx)^2}-\frac{2b^3B^2n^2(c+dx)^3}{27(bc-ad)^4g^4i(a+bx)^3}-\frac{6bBd^2n(c+dx)\left(A+B\log\left(e\right.\right.}{(bc-ad)^4g^4i(a+bx}$$

```
[Out] -6*b*B^2*d^2*n^2*(d*x+c)/(-a*d+b*c)^4/g^4/i/(b*x+a)+3/4*b^2*B^2*d*n^2*(d*x+
c)^2/(-a*d+b*c)^4/g^4/i/(b*x+a)^2-2/27*b^3*B^2*n^2*(d*x+c)^3/(-a*d+b*c)^4/g
^4/i/(b*x+a)^3-6*b*B*d^2*n*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*
c)^4/g^4/i/(b*x+a)+3/2*b^2*B*d*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/
(-a*d+b*c)^4/g^4/i/(b*x+a)^2-2/9*b^3*B*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+
c))^n))/(-a*d+b*c)^4/g^4/i/(b*x+a)^3-3*b*d^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*
x+c))^n))^2/(-a*d+b*c)^4/g^4/i/(b*x+a)+3/2*b^2*d*(d*x+c)^2*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))^2/(-a*d+b*c)^4/g^4/i/(b*x+a)^2-1/3*b^3*(d*x+c)^3*(A+B*ln(e*
((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/g^4/i/(b*x+a)^3-1/3*d^3*(A+B*ln(e*((b*
x+a)/(d*x+c))^n))^3/B/(-a*d+b*c)^4/g^4/i/n
```

Rubi [A]

time = 0.35, antiderivative size = 543, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2561, 2395, 2342, 2341, 2339, 30}

$$-\frac{b^3(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^4i(a+bx)^3(bc-ad)^4}-\frac{2b^3Bn(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^4i(a+bx)^3(bc-ad)^4}+\frac{3b^2d(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^4i(a+bx)^2(bc-ad)^4}+\frac{3b^2Bdn(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^4i(a+bx)^2(bc-ad)^4}-\frac{d^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bg^4in(bc-ad)^4}-\frac{3bd^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^4i(a+bx)(bc-ad)^4}-\frac{6bBd^2n(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i(a+bx)(bc-ad)^4}-\frac{2b^3B^2n^2(c+dx)^3}{27g^4i(a+bx)^3(bc-ad)^4}+\frac{3b^2B^2dn^2(c+dx)^2}{4g^4i(a+bx)^2(bc-ad)^4}-\frac{6bB^2d^2n^2(c+dx)}{g^4i(a+bx)(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i + d*i*x)
),x]
```

```
[Out] (-6*b*B^2*d^2*n^2*(c + d*x))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*B^2*d
*n^2*(c + d*x)^2)/(4*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (2*b^3*B^2*n^2*(c +
 d*x)^3)/(27*(b*c - a*d)^4*g^4*i*(a + b*x)^3) - (6*b*B*d^2*n*(c + d*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^
2*B*d*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^
4*g^4*i*(a + b*x)^2) - (2*b^3*B*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(9*(b*c - a*d)^4*g^4*i*(a + b*x)^3) - (3*b*d^2*(c + d*x)*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2
*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^4*g
^4*i*(a + b*x)^2) - (b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2)/(3*(b*c - a*d)^4*g^4*i*(a + b*x)^3) - (d^3*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^3)/(3*B*(b*c - a*d)^4*g^4*i*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(193c+193dx)(ag+bgx)^4}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc-ad)g^4(a+bx)^4} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc-ad)^2g^4(a+bx)^3} + \frac{bd^2(A+}{193(bc}\right.$$

$$= -\frac{(bd^3)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{193(bc-ad)^4g^4} + \frac{d^4\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{193(bc-ad)^4g^4} + \frac{(bd^2)\int}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc-ad)^2g^4(a+bx)^2} - \frac{d^2(A+B\log}{193(bc-ad}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc-ad)^2g^4(a+bx)^2} - \frac{d^2(A+B\log}{193(bc-ad}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc-ad)^2g^4(a+bx)^2} - \frac{d^2(A+B\log}{193(bc-ad}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc-ad)^2g^4(a+bx)^2} - \frac{d^2(A+B\log}{193(bc-ad}$$

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1737(bc-ad)g^4(a+bx)^3} + \frac{5Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1158(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd}{57}$$

$$= \frac{B^2d^3\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{193(bc-ad)^4g^4} - \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1737(bc-ad)g^4(a+bx)^3} + \frac{5Bd}{115}$$

$$= \frac{B^2d^3\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{193(bc-ad)^4g^4} + \frac{B^2d^3\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{193(bc-ad)^4g^4}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{3474(bc-a}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{3474(bc-a}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{3474(bc-a}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{3474(bc-a}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B}{3474(bc-a}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1295 vs. $2(543) = 1086$.
time = 1.12, size = 1295, normalized size = 2.38

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i +
d*i*x)),x]
```

```
[Out] -1/108*(36*B^2*d^3*n^2*(a + b*x)^3*Log[(a + b*x)/(c + d*x)]^3 + 18*B*n*Log[
(a + b*x)/(c + d*x)]^2*(6*a^3*A*d^3 + 2*b^3*B*c^3*n - 9*a*b^2*B*c^2*d*n + 1
8*a^2*b*B*c*d^2*n + 18*a^2*A*b*d^3*x - 3*b^3*B*c^2*d*n*x + 18*a*b^2*B*c*d^2
*n*x + 18*a^2*b*B*d^3*n*x + 18*a*A*b^2*d^3*x^2 + 6*b^3*B*c*d^2*n*x^2 + 27*a
*b^2*B*d^3*n*x^2 + 6*A*b^3*d^3*x^3 + 11*b^3*B*d^3*n*x^3 + 6*B*d^3*(a + b*x)
^3*Log[e*((a + b*x)/(c + d*x))^n] - 6*B*d^3*n*(a + b*x)^3*Log[(a + b*x)/(c
+ d*x)]) - 3*d*(b*c - a*d)^2*(a + b*x)*(18*A^2 + 30*A*B*n + 19*B^2*n^2 + 18
*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 5*B*n)*Log[(a + b*x)/(
c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c
 + d*x))^n]*(6*A + 5*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d^2*(b*c -
a*d)*(a + b*x)^2*(18*A^2 + 66*A*B*n + 85*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/
(c + d*x))^n]^2 - 6*B*n*(6*A + 11*B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^
2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(6*A + 11
*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d^3*(a + b*x)^3*Log[a + b*x]*(1
8*A^2 + 66*A*B*n + 85*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6
*B*n*(6*A + 11*B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c
+ d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(6*A + 11*B*n - 6*B*n*Log[(a
 + b*x)/(c + d*x)])) + 4*(b*c - a*d)^3*(9*A^2 + 6*A*B*n + 2*B^2*n^2 + 9*B^2
*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(3*A + B*n)*Log[(a + b*x)/(c + d*
x)] + 9*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x)
)^n]*(3*A + B*n - 3*B*n*Log[(a + b*x)/(c + d*x)])) + 6*B*(b*c - a*d)*n*Log[
(a + b*x)/(c + d*x)]*(3*d*(-(b*c) + a*d)*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e
*((a + b*x)/(c + d*x))^n] - 6*B*n*Log[(a + b*x)/(c + d*x)]) + 6*d^2*(a + b*
x)^2*(6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n] - 6*B*n*Log[(a + b*
x)/(c + d*x)]) + 4*(b*c - a*d)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x
))^n] - 3*B*n*Log[(a + b*x)/(c + d*x)])) - 6*d^3*(a + b*x)^3*(18*A^2 + 66*A
*B*n + 85*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A +
11*B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 +
6*B*Log[e*((a + b*x)/(c + d*x))^n]*(6*A + 11*B*n - 6*B*n*Log[(a + b*x)/(c +
 d*x)]))*Log[c + d*x])/((b*c - a*d)^4*g^4*i*(a + b*x)^3)
```

Maple [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(bgx+ag\right)^{4}\left(dix+ci\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3415 vs. 2(506) = 1012.
time = 0.97, size = 3415, normalized size = 6.29

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] -1/6*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d
 - 5*a*b*d^2)*x)/((I*b^6*c^3 - 3*I*a*b^5*c^2*d + 3*I*a^2*b^4*c*d^2 - I*a^3*b
^3*d^3)*g^4*x^3 + 3*(I*a*b^5*c^3 - 3*I*a^2*b^4*c^2*d + 3*I*a^3*b^3*c*d^2 -
I*a^4*b^2*d^3)*g^4*x^2 + 3*(I*a^2*b^4*c^3 - 3*I*a^3*b^3*c^2*d + 3*I*a^4*b^2
*c*d^2 - I*a^5*b*d^3)*g^4*x + (I*a^3*b^3*c^3 - 3*I*a^4*b^2*c^2*d + 3*I*a^5*
b*c*d^2 - I*a^6*d^3)*g^4) + 6*d^3*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*
d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4) - 6*d^3*log(d*x
 + c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3
 + I*a^4*d^4)*g^4))*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2 - 1/3*A*B*((6*
b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*
x)/((I*b^6*c^3 - 3*I*a*b^5*c^2*d + 3*I*a^2*b^4*c*d^2 - I*a^3*b^3*d^3)*g^4*x
^3 + 3*(I*a*b^5*c^3 - 3*I*a^2*b^4*c^2*d + 3*I*a^3*b^3*c*d^2 - I*a^4*b^2*d^3
)*g^4*x^2 + 3*(I*a^2*b^4*c^3 - 3*I*a^3*b^3*c^2*d + 3*I*a^4*b^2*c*d^2 - I*a^
5*b*d^3)*g^4*x + (I*a^3*b^3*c^3 - 3*I*a^4*b^2*c^2*d + 3*I*a^5*b*c*d^2 - I*a
^6*d^3)*g^4) + 6*d^3*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b
^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^4) - 6*d^3*log(d*x + c)/((I*b^4
*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)
*g^4))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/108*((-8*I*b^3*c^3 + 81*I
*a*b^2*c^2*d - 648*I*a^2*b*c*d^2 + 575*I*a^3*d^3 - 36*(I*b^3*d^3*x^3 + 3*I*
a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a)^3 - 36*(-I*b^3*d^
3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*log(d*x + c)^3 - 5
10*(I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 - 198*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^
2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*log(b*x + a)^2 - 18*(-11*I*b^3*d^3*x^3 - 3
3*I*a*b^2*d^3*x^2 - 33*I*a^2*b*d^3*x - 11*I*a^3*d^3 + 6*(I*b^3*d^3*x^3 + 3*
I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a))*log(d*x + c)^2
 - 3*(-19*I*b^3*c^2*d + 378*I*a*b^2*c*d^2 - 359*I*a^2*b*d^3)*x - 510*(I*b^3
*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a) -
6*(-85*I*b^3*d^3*x^3 - 255*I*a*b^2*d^3*x^2 - 255*I*a^2*b*d^3*x - 85*I*a^3*d
^3 + 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*
log(b*x + a)^2 + 66*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x +
```

```
I*a^3*d^3)*log(b*x + a))*log(d*x + c))*n^2/(a^3*b^4*c^4*g^4 - 4*a^4*b^3*c^3
*d*g^4 + 6*a^5*b^2*c^2*d^2*g^4 - 4*a^6*b*c*d^3*g^4 + a^7*d^4*g^4 + (b^7*c^4
*g^4 - 4*a*b^6*c^3*d*g^4 + 6*a^2*b^5*c^2*d^2*g^4 - 4*a^3*b^4*c*d^3*g^4 + a^
4*b^3*d^4*g^4)*x^3 + 3*(a*b^6*c^4*g^4 - 4*a^2*b^5*c^3*d*g^4 + 6*a^3*b^4*c^2
*d^2*g^4 - 4*a^4*b^3*c*d^3*g^4 + a^5*b^2*d^4*g^4)*x^2 + 3*(a^2*b^5*c^4*g^4
- 4*a^3*b^4*c^3*d*g^4 + 6*a^4*b^3*c^2*d^2*g^4 - 4*a^5*b^2*c*d^3*g^4 + a^6*b
*d^4*g^4)*x) + 6*(-4*I*b^3*c^3 + 27*I*a*b^2*c^2*d - 108*I*a^2*b*c*d^2 + 85*
I*a^3*d^3 - 66*(I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 - 18*(-I*b^3*d^3*x^3 - 3*I*a
*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*log(b*x + a)^2 - 18*(-I*b^3*d^3
*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*log(d*x + c)^2 - 3*
(-5*I*b^3*c^2*d + 54*I*a*b^2*c*d^2 - 49*I*a^2*b*d^3)*x - 66*(I*b^3*d^3*x^3
+ 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a) - 6*(-11*I*
b^3*d^3*x^3 - 33*I*a*b^2*d^3*x^2 - 33*I*a^2*b*d^3*x - 11*I*a^3*d^3 + 6*(I*b
^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log(b*x + a))
*log(d*x + c))*n*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(a^3*b^4*c^4*g^4 -
4*a^4*b^3*c^3*d*g^4 + 6*a^5*b^2*c^2*d^2*g^4 - 4*a^6*b*c*d^3*g^4 + a^7*d^4*g
^4 + (b^7*c^4*g^4 - 4*a*b^6*c^3*d*g^4 + 6*a^2*b^5*c^2*d^2*g^4 - 4*a^3*b^4*c
*d^3*g^4 + a^4*b^3*d^4*g^4)*x^3 + 3*(a*b^6*c^4*g^4 - 4*a^2*b^5*c^3*d*g^4 +
6*a^3*b^4*c^2*d^2*g^4 - 4*a^4*b^3*c*d^3*g^4 + a^5*b^2*d^4*g^4)*x^2 + 3*(a^2
*b^5*c^4*g^4 - 4*a^3*b^4*c^3*d*g^4 + 6*a^4*b^3*c^2*d^2*g^4 - 4*a^5*b^2*c*d^
3*g^4 + a^6*b*d^4*g^4)*x))*B^2 - 1/18*(-4*I*b^3*c^3 + 27*I*a*b^2*c^2*d - 10
8*I*a^2*b*c*d^2 + 85*I*a^3*d^3 - 66*(I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 - 18*(-
I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3)*log(b*x +
a)^2 - 18*(-I*b^3*d^3*x^3 - 3*I*a*b^2*d^3*x^2 - 3*I*a^2*b*d^3*x - I*a^3*d^3
)*log(d*x + c)^2 - 3*(-5*I*b^3*c^2*d + 54*I*a*b^2*c*d^2 - 49*I*a^2*b*d^3)*x
 - 66*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a^3*d^3)*log
(b*x + a) - 6*(-11*I*b^3*d^3*x^3 - 33*I*a*b^2*d^3*x^2 - 33*I*a^2*b*d^3*x -
11*I*a^3*d^3 + 6*(I*b^3*d^3*x^3 + 3*I*a*b^2*d^3*x^2 + 3*I*a^2*b*d^3*x + I*a
^3*d^3)*log(b*x + a))*log(d*x + c))*A*B*n/(a^3*b^4*c^4*g^4 - 4*a^4*b^3*c^3*
d*g^4 + 6*a^5*b^2*c^2*d^2*g^4 - 4*a^6*b*c*d^3*g^4 + a^7*d^4*g^4 + (b^7*c^4*
g^4 - 4*a*b^6*c^3*d*g^4 + 6*a^2*b^5*c^2*d^2*g^4 - 4*a^3*b^4*c*d^3*g^4 + a^4
*b^3*d^4*g^4)*x^3 + 3*(a*b^6*c^4*g^4 - 4*a^2*b^5*c^3*d*g^4 + 6*a^3*b^4*c^2*
d^2*g^4 - 4*a^4*b^3*c*d^3*g^4 + a^5*b^2*d^4*g^4)*x^2 + 3*(a^2*b^5*c^4*g^4 -
 4*a^3*b^4*c^3*d*g^4 + 6*a^4*b^3*c^2*d^2*g^4 - 4*a^5*b^2*c*d^3*g^4 + a^6*b*
d^4*g^4)*x) - 1/6*A^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2
- 3*(b^2*c*d - 5*a*b*d^2)*x)/((I*b^6*c^3 - 3*I*a*b^5*c^2*d + 3*I*a^2*b^4*c*
d^2 - I*a^3*b^3*d^3)*g^4*x^3 + 3*(I*a*b^5*c^3 -...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1548 vs. $2(506) = 1012$.
time = 0.49, size = 1548, normalized size = 2.85

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] -1/108*(36*(-I*A^2 - 2*I*A*B - I*B^2)*b^3*c^3 + 162*(I*A^2 + 2*I*A*B + I*B^
2)*a*b^2*c^2*d + 324*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b*c*d^2 + 198*(I*A^2 +
2*I*A*B + I*B^2)*a^3*d^3 + 36*(-I*B^2*b^3*d^3*n^2*x^3 - 3*I*B^2*a*b^2*d^3*n
^2*x^2 - 3*I*B^2*a^2*b*d^3*n^2*x - I*B^2*a^3*d^3*n^2)*log((b*x + a)/(d*x +
c))^3 - (8*I*B^2*b^3*c^3 - 81*I*B^2*a*b^2*c^2*d + 648*I*B^2*a^2*b*c*d^2 - 5
75*I*B^2*a^3*d^3)*n^2 + 6*(18*(-I*A^2 - 2*I*A*B - I*B^2)*b^3*c*d^2 + 18*(I*
A^2 + 2*I*A*B + I*B^2)*a*b^2*d^3 + 85*(-I*B^2*b^3*c*d^2 + I*B^2*a*b^2*d^3)*
n^2 + 66*((-I*A*B - I*B^2)*b^3*c*d^2 + (I*A*B + I*B^2)*a*b^2*d^3)*n)*x^2 +
18*(6*(-I*A*B - I*B^2)*a^3*d^3*n + (-11*I*B^2*b^3*d^3*n^2 + 6*(-I*A*B - I*B
^2)*b^3*d^3*n)*x^3 + (-2*I*B^2*b^3*c^3 + 9*I*B^2*a*b^2*c^2*d - 18*I*B^2*a^2
*b*c*d^2)*n^2 + 3*(6*(-I*A*B - I*B^2)*a*b^2*d^3*n + (-2*I*B^2*b^3*c*d^2 - 9
*I*B^2*a*b^2*d^3)*n^2)*x^2 + 3*(6*(-I*A*B - I*B^2)*a^2*b*d^3*n + (I*B^2*b^3
*c^2*d - 6*I*B^2*a*b^2*c*d^2 - 6*I*B^2*a^2*b*d^3)*n^2)*x)*log((b*x + a)/(d*
x + c))^2 + 6*(4*(-I*A*B - I*B^2)*b^3*c^3 + 27*(I*A*B + I*B^2)*a*b^2*c^2*d
+ 108*(-I*A*B - I*B^2)*a^2*b*c*d^2 + 85*(I*A*B + I*B^2)*a^3*d^3)*n + 3*(18*
(I*A^2 + 2*I*A*B + I*B^2)*b^3*c^2*d + 108*(-I*A^2 - 2*I*A*B - I*B^2)*a*b^2*
c*d^2 + 90*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b*d^3 + (19*I*B^2*b^3*c^2*d - 378*
I*B^2*a*b^2*c*d^2 + 359*I*B^2*a^2*b*d^3)*n^2 + 6*(5*(I*A*B + I*B^2)*b^3*c^2
*d + 54*(-I*A*B - I*B^2)*a*b^2*c*d^2 + 49*(I*A*B + I*B^2)*a^2*b*d^3)*n)*x +
 6*(18*(-I*A^2 - 2*I*A*B - I*B^2)*a^3*d^3 + (-85*I*B^2*b^3*d^3*n^2 + 66*(-I
*A*B - I*B^2)*b^3*d^3*n + 18*(-I*A^2 - 2*I*A*B - I*B^2)*b^3*d^3)*x^3 + (-4*
I*B^2*b^3*c^3 + 27*I*B^2*a*b^2*c^2*d - 108*I*B^2*a^2*b*c*d^2)*n^2 + 3*(18*(
-I*A^2 - 2*I*A*B - I*B^2)*a*b^2*d^3 + (-22*I*B^2*b^3*c*d^2 - 63*I*B^2*a*b^2
*d^3)*n^2 + 6*(2*(-I*A*B - I*B^2)*b^3*c*d^2 + 9*(-I*A*B - I*B^2)*a*b^2*d^3)
*n)*x^2 + 6*(2*(-I*A*B - I*B^2)*b^3*c^3 + 9*(I*A*B + I*B^2)*a*b^2*c^2*d + 1
8*(-I*A*B - I*B^2)*a^2*b*c*d^2)*n + 3*(18*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b*
d^3 + (5*I*B^2*b^3*c^2*d - 54*I*B^2*a*b^2*c*d^2 - 36*I*B^2*a^2*b*d^3)*n^2 +
 6*((I*A*B + I*B^2)*b^3*c^2*d + 6*(-I*A*B - I*B^2)*a*b^2*c*d^2 + 6*(-I*A*B
- I*B^2)*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))/((b^7*c^4 - 4*a*b^6*c^3
*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^4*x^3 + 3*(a*b^6*
c^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5*b^2*d^4)*
g^4*x^2 + 3*(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2 - 4*a^5*b^2*
c*d^3 + a^6*b*d^4)*g^4*x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6*a^5*b^2*c^2*d
^2 - 4*a^6*b*c*d^3 + a^7*d^4)*g^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4/(d*i*x+c*i),x)
```

[Out] Timed out

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] Timed out
```

Mupad [**B**]
time = 10.34, size = 1921, normalized size = 3.54

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^4*(c*i + d*i*x)
),x)
```

```
[Out] ((198*A^2*a^2*d^2 + 36*A^2*b^2*c^2 + 575*B^2*a^2*d^2*n^2 + 8*B^2*b^2*c^2*n^
2 - 126*A^2*a*b*c*d + 510*A*B*a^2*d^2*n + 24*A*B*b^2*c^2*n - 73*B^2*a*b*c*d
*n^2 - 138*A*B*a*b*c*d*n)/(6*(a*d - b*c)) + (x^2*(18*A^2*b^2*d^2 + 85*B^2*b
^2*d^2*n^2 + 66*A*B*b^2*d^2*n))/(a*d - b*c) + (x*(90*A^2*a*b*d^2 - 18*A^2*b
^2*c*d + 359*B^2*a*b*d^2*n^2 - 19*B^2*b^2*c*d*n^2 + 294*A*B*a*b*d^2*n - 30*
A*B*b^2*c*d*n))/(2*(a*d - b*c)))/(x*(54*a^4*b*d^2*g^4*i + 54*a^2*b^3*c^2*g^
4*i - 108*a^3*b^2*c*d*g^4*i) + x^2*(54*a*b^4*c^2*g^4*i + 54*a^3*b^2*d^2*g^4
*i - 108*a^2*b^3*c*d*g^4*i) + x^3*(18*b^5*c^2*g^4*i + 18*a^2*b^3*d^2*g^4*i
- 36*a*b^4*c*d*g^4*i) + 18*a^5*d^2*g^4*i + 18*a^3*b^2*c^2*g^4*i - 36*a^4*b*
c*d*g^4*i) - log(e*((a + b*x)/(c + d*x))^n)^2*((d^3*(11*B^2*n + 6*A*B))/(6*
g^4*i*n*(a*d - b*c)*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) -
(B^2*d^3*(x*(b*((g^4*i*n*(a*d - b*c)*(3*a*d - b*c))/(6*d^2) + (a*g^4*i*n*(a
*d - b*c))/(3*d)) + (2*a*b*g^4*i*n*(a*d - b*c))/(3*d) + (b*g^4*i*n*(a*d - b
*c)*(3*a*d - b*c))/(3*d^2)) + a*((g^4*i*n*(a*d - b*c)*(3*a*d - b*c))/(6*d^2
) + (a*g^4*i*n*(a*d - b*c))/(3*d)) + (g^4*i*n*(a*d - b*c)*(3*a^2*d^2 + b^2*
c^2 - 3*a*b*c*d))/(3*d^3) + (b^2*g^4*i*n*x^2*(a*d - b*c))/d))/(g^4*i*n*(a*d
 - b*c)*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)*(a^3*g^4*i + b^
3*g^4*i*x^3 + 3*a^2*b*g^4*i*x + 3*a*b^2*g^4*i*x^2))) - log(e*((a + b*x)/(c
+ d*x))^n)*((6*B^2*a*d*n - 3*B^2*b*c*n + 3*B^2*b*d*n*x)/(x*(9*a^4*b*d^2*g^4
*i + 9*a^2*b^3*c^2*g^4*i - 18*a^3*b^2*c*d*g^4*i) + x^2*(9*a*b^4*c^2*g^4*i +
 9*a^3*b^2*d^2*g^4*i - 18*a^2*b^3*c*d*g^4*i) + x^3*(3*b^5*c^2*g^4*i + 3*a^2
*b^3*d^2*g^4*i - 6*a*b^4*c*d*g^4*i) + 3*a^5*d^2*g^4*i + 3*a^3*b^2*c^2*g^4*i
 - 6*a^4*b*c*d*g^4*i) - (d^3*(11*B^2*n + 6*A*B)*(x*(b*((a*g^4*i*n*(a*d - b*
c)^3)/d + (g^4*i*n*(a*d - b*c)^3*(3*a*d - b*c))/(2*d^2)) + (2*a*b*g^4*i*n*(
```

```
a*d - b*c)^3)/d + (b*g^4*i*n*(a*d - b*c)^3*(3*a*d - b*c))/d^2) + a*((a*g^4*
i*n*(a*d - b*c)^3)/d + (g^4*i*n*(a*d - b*c)^3*(3*a*d - b*c))/(2*d^2)) + (g^
4*i*n*(a*d - b*c)^3*(3*a^2*d^2 + b^2*c^2 - 3*a*b*c*d))/d^3 + (3*b^2*g^4*i*n
*x^2*(a*d - b*c)^3)/d))/(3*g^4*i*n*(a*d - b*c)*(a^3*d^3 - b^3*c^3 + 3*a*b^2
*c^2*d - 3*a^2*b*c*d^2)*(x*(9*a^4*b*d^2*g^4*i + 9*a^2*b^3*c^2*g^4*i - 18*a^
3*b^2*c*d*g^4*i) + x^2*(9*a*b^4*c^2*g^4*i + 9*a^3*b^2*d^2*g^4*i - 18*a^2*b^
3*c*d*g^4*i) + x^3*(3*b^5*c^2*g^4*i + 3*a^2*b^3*d^2*g^4*i - 6*a*b^4*c*d*g^4
*i) + 3*a^5*d^2*g^4*i + 3*a^3*b^2*c^2*g^4*i - 6*a^4*b*c*d*g^4*i))) + (d^3*a
tan((d^3*(A^2 + (85*B^2*n^2)/18 + (11*A*B*n)/3)*(18*a^4*d^4*g^4*i - 18*b^4*
c^4*g^4*i + 36*a*b^3*c^3*d*g^4*i - 36*a^3*b*c*d^3*g^4*i)*1i)/(g^4*i*(a*d -
b*c)^4*(18*A^2*d^3 + 85*B^2*d^3*n^2 + 66*A*B*d^3*n)) + (b*d^4*x*(A^2 + (85*
B^2*n^2)/18 + (11*A*B*n)/3)*(a^3*d^3*g^4*i - b^3*c^3*g^4*i + 3*a*b^2*c^2*d*
g^4*i - 3*a^2*b*c*d^2*g^4*i)*36i)/(g^4*i*(a*d - b*c)^4*(18*A^2*d^3 + 85*B^2
*d^3*n^2 + 66*A*B*d^3*n)))*(A^2 + (85*B^2*n^2)/18 + (11*A*B*n)/3)*2i)/(g^4*
i*(a*d - b*c)^4) - (B^2*d^3*log(e*((a + b*x)/(c + d*x))^n)^3)/(3*g^4*i*n*(a
*d - b*c)*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))
```

3.194 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=770

$$\frac{2AB(bc-ad)^2g^3n(a+bx)}{d^3i^2(c+dx)}-\frac{2B^2(bc-ad)^2g^3n^2(a+bx)}{d^3i^2(c+dx)}+\frac{2B^2(bc-ad)^2g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^3i^2(c+dx)}-\frac{bB(b}{}$$

```
[Out] 2*A*B*(-a*d+b*c)^2*g^3*n*(b*x+a)/d^3/i^2/(d*x+c)-2*B^2*(-a*d+b*c)^2*g^3*n^2
*(b*x+a)/d^3/i^2/(d*x+c)+2*B^2*(-a*d+b*c)^2*g^3*n*(b*x+a)*ln(e*((b*x+a)/(d*
x+c))^n)/d^3/i^2/(d*x+c)-b*B*(-a*d+b*c)*g^3*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d
*x+c))^n))/d^3/i^2-3*b*(-a*d+b*c)*g^3*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n
))^2/d^3/i^2-(-a*d+b*c)^2*g^3*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^3
/i^2/(d*x+c)+1/2*b^3*g^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^4/i^
2-6*b*B*(-a*d+b*c)^2*g^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/
(d*x+c))/d^4/i^2-3*b*(-a*d+b*c)^2*g^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln(
(-a*d+b*c)/b/(d*x+c))/d^4/i^2+b*B^2*(-a*d+b*c)^2*g^3*n^2*ln(d*x+c)/d^4/i^2+
b*B*(-a*d+b*c)^2*g^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*
x+a))/d^4/i^2-6*b*B^2*(-a*d+b*c)^2*g^3*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/d
^4/i^2-6*b*B*(-a*d+b*c)^2*g^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,d
*(b*x+a)/b/(d*x+c))/d^4/i^2-b*B^2*(-a*d+b*c)^2*g^3*n^2*polylog(2,b*(d*x+c)/
d/(b*x+a))/d^4/i^2+6*b*B^2*(-a*d+b*c)^2*g^3*n^2*polylog(3,d*(b*x+a)/b/(d*x+
c))/d^4/i^2
```

Rubi [A]
time = 0.50, antiderivative size = 770, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 14, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.311$, Rules used = {2561, 2395, 2333, 2332, 2356, 2389, 2379, 2438, 2351, 31, 2355, 2354, 2421, 6724}

[illegible]

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)^2*g^3*n*(a + b*x))/(d^3*i^2*(c + d*x)) - (2*B^2*(b*c - a
*d)^2*g^3*n^2*(a + b*x))/(d^3*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)^2*g^3*n*(
a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^3*i^2*(c + d*x)) - (b*B*(b*c -
a*d)*g^3*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^2) - (3
*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3
*i^2) - ((b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2)/(d^3*i^2*(c + d*x)) + (b^3*g^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2)/(2*d^4*i^2) - (6*b*B*(b*c - a*d)^2*g^3*n*(A + B*Log[e*((a + b
```

```
*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i^2) - (3*b*(b*c -
a*d)^2*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c +
 d*x))])/(d^4*i^2) + (b*B^2*(b*c - a*d)^2*g^3*n^2*Log[c + d*x])/(d^4*i^2) +
 (b*B*(b*c - a*d)^2*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b
*(c + d*x))/(d*(a + b*x))])/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*n^2*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2) - (6*b*B*(b*c - a*d)^2*g^3*n
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*
x))])/(d^4*i^2) - (b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[2, (b*(c + d*x))/(d*
(a + b*x))])/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[3, (d*(a +
b*x))/(b*(c + d*x))])/(d^4*i^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[x*(d + e*x^r)^(q + 1)*((a + b*Log[c*x^n])/d), x] - Dist[b*
(n/d), Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2356

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/(e*(q + 1))), x]
- Dist[b*n*(p/(e*(q + 1))), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2389

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[(d + e*x)^(q + 1)*((a + b*Log[c*x^n])^p/x)
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(194c+194dx)^2}\,dx = \int \left(-\frac{b^2(2bc-3ad)g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3} + \frac{b^3g^3x(A+\cdots}{\cdots}\right.$$

$$= \frac{(b^3g^3)\int x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx}{37636d^2} - \frac{(b^2(2bc-3ad)g^3)\int\cdots}{\cdots}$$

$$= -\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3} + \frac{b^3g^3x^2(A+B\cdots}{75\cdots}$$

$$= -\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3} + \frac{b^3g^3x^2(A+B\cdots}{75\cdots}$$

$$= -\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3} + \frac{b^3g^3x^2(A+B\cdots}{75\cdots}$$

$$= -\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3} + \frac{b^3g^3x^2(A+B\cdots}{75\cdots}$$

$$= -\frac{Ab^2B(bc-ad)g^3nx}{37636d^3} - \frac{B(bc-ad)^3g^3n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\cdots\right)\right)}{18818d^4(c+dx)}$$

$$= -\frac{Ab^2B(bc-ad)g^3nx}{37636d^3} - \frac{bB^2(bc-ad)g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)\cdots\right)}{37636d^3}$$

$$= -\frac{Ab^2B(bc-ad)g^3nx}{37636d^3} - \frac{bB^2(bc-ad)g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)\cdots\right)}{37636d^3}$$

$$= -\frac{Ab^2B(bc-ad)g^3nx}{37636d^3} + \frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)} + \frac{bB^2(bc-ad)^2g\cdots}{188\cdots}$$

$$= -\frac{Ab^2B(bc-ad)g^3nx}{37636d^3} + \frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)} + \frac{bB^2(bc-ad)^2g\cdots}{188\cdots}$$

$$= -\frac{Ab^2B(bc-ad)g^3nx}{37636d^3} + \frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)} + \frac{bB^2(bc-ad)^2g\cdots}{188\cdots}$$

$$= -\frac{Ab^2B(bc-ad)g^3nx}{37636d^3} + \frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)} + \frac{bB^2(bc-ad)^2g\cdots}{188\cdots}$$

$$= -\frac{Ab^2B(bc-ad)g^3nx}{37636d^3} + \frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)} + \frac{bB^2(bc-ad)^2g\cdots}{188\cdots}$$

$$-\frac{Ab^2B(bc-ad)g^3nx}{\cdots} + \frac{B^2(bc-ad)^3g^3n^2}{\cdots} + \frac{bB^2(bc-ad)^2g\cdots}{\cdots}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 3540 vs. $2(770) = 1540$.
time = 6.02, size = 3540, normalized size = 4.60

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x)^2,x]
```

```
[Out] (g^3*(-2*b^2*d*(2*b*c - 3*a*d)*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*
n*Log[(a + b*x)/(c + d*x)])^2 + b^3*d^2*x^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + (2*(b*c - a*d)^3*(A + B*Log[e*((
a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2)/(c + d*x) + 6*b*(
b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c +
 d*x)])^2*Log[c + d*x] + (4*a^3*B*d^3*n*(-A - B*Log[e*((a + b*x)/(c + d*x))
^n] + B*n*Log[(a + b*x)/(c + d*x)])*(b*c - a*d + b*(c + d*x)*Log[a/b + x] +
 (-(b*c) + a*d)*Log[(a + b*x)/(c + d*x)] - b*c*Log[(b*(c + d*x))/(b*c - a*d
)] - b*d*x*Log[(b*(c + d*x))/(b*c - a*d)]))/((-(b*c) + a*d)*(c + d*x)) + 6*
a^2*b*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c
+ d*x)])*(-Log[c/d + x]^2 + 2*Log[c/d + x]*Log[c + d*x] + 2*(-(c/(c + d*x))
 + (b*c*Log[a + b*x])/(-(b*c) + a*d) + (b*c*Log[c + d*x])/(b*c - a*d) - Log
[a/b + x]*Log[c + d*x] + Log[(a + b*x)/(c + d*x)]*(c/(c + d*x) + Log[c + d*
x]) + Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)]) + 2*b^3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B
*n*Log[(a + b*x)/(c + d*x)])*(-4*c^2 + (4*a*c*d)/b - c*d*x + (a*d^2*x)/b -
(2*c^3)/(c + d*x) + 4*c^2*Log[c/d + x] - 3*c^2*Log[c/d + x]^2 - (a^2*d^2*Lo
g[a + b*x])/b^2 + (2*b*c^3*Log[a + b*x])/(-(b*c) + a*d) - 4*c*d*x*Log[(a +
b*x)/(c + d*x)] + d^2*x^2*Log[(a + b*x)/(c + d*x)] + (2*c^3*Log[(a + b*x)/(
c + d*x)])/(c + d*x) + c^2*Log[c + d*x] + (2*b*c^3*Log[c + d*x])/(b*c - a*d
) + 6*c^2*Log[c/d + x]*Log[c + d*x] + 6*c^2*Log[(a + b*x)/(c + d*x)]*Log[c
+ d*x] - (2*c*Log[a/b + x]*(2*a*d + 3*b*c*Log[c + d*x] - 3*b*c*Log[(b*(c +
d*x))/(b*c - a*d)]))/b + 6*c^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) +
12*a*b^2*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c
 + d*x)])*(d*(a/b + x)*(-1 + Log[a/b + x]) - (c^2*Log[a/b + x])/(c + d*x) -
 (c + d*x)*(-1 + Log[c/d + x]) + c*Log[c/d + x]^2 + (c^2*(1 + Log[c/d + x])
)/(c + d*x) + (b*c^2*(Log[a + b*x] - Log[c + d*x]))/(b*c - a*d) + (-Log[a/b
 + x] + Log[c/d + x] + Log[(a + b*x)/(c + d*x)])*(d*x - c^2/(c + d*x) - 2*c
*Log[c + d*x]) - 2*c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog
[2, (d*(a + b*x))/(-(b*c) + a*d)])) - (2*a^3*B^2*d^3*n^2*(2*b*c - 2*a*d + 2
*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c
 + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + (b*c - a*d)*Log[(a + b*x)/(
c + d*x)]^2 - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c +
 d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a +
b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*
```

```
c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*
x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x)) + 6*a*b^2*B^2*d*n^2*((d*(a
+ b*x)*Log[(a + b*x)/(c + d*x)]^2)/b - (c^2*Log[(a + b*x)/(c + d*x)]^2)/(c
+ d*x) + 2*c*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (c
^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x
)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c
 + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*
d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
 d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c +
 d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
+ Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
)))/((b*c - a*d)*(c + d*x)) - ((b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*
(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)/(c + d*x)] + Log[(b*
c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b + 4*
c*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyL
og[3, (d*(a + b*x))/(b*(c + d*x))])) + b^3*B^2*n^2*(d^2*x^2*Log[(a + b*x)/(
c + d*x)]^2 - (4*c*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2)/b + (2*c^3*Log[(
a + b*x)/(c + d*x)]^2)/(c + d*x) - 6*c^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*
c - a*d)/(b*c + b*d*x)] - (2*d*(b*c - a*d)*(a + b*x)*Log[(a + b*x)/(c + d*x
)] + 2*a^2*d^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*(b*c - a*d)^2*Log[
c + d*x] + 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)
] - a^2*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
 - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - b^2*c^2*(Log[(b*c - a*d)/(
b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c +
 b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b^2 + (2*c^3*(2*b*c -
 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)
] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log
[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b
*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
 - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[
(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))...
```

Maple [F]

time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{(bgx + ag)^3 \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(dix + ci)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] -2*A*B*a^3*g^3*n*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d -
a*d^2) + 1/(d^2*x + c*d)) - 1/2*(2*c^3/(d^5*x + c*d^4) + 6*c^2*log(d*x + c)
/d^4 + (d*x^2 - 4*c*x)/d^3)*A^2*b^3*g^3 + 3*A^2*a*b^2*(c^2/(d^4*x + c*d^3)
- x/d^2 + 2*c*log(d*x + c)/d^3)*g^3 - 3*A^2*a^2*b*g^3*(c/(d^3*x + c*d^2) +
log(d*x + c)/d^2) + 2*A*B*a^3*g^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(d
^2*x + c*d) + A^2*a^3*g^3/(d^2*x + c*d) - 1/2*(B^2*b^3*d^3*g^3*x^3 - 3*(b^3
*c*d^2*g^3 - 2*a*b^2*d^3*g^3)*B^2*x^2 - 2*(2*b^3*c^2*d*g^3 - 3*a*b^2*c*d^2*
g^3)*B^2*x + 2*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d
^3*g^3)*B^2 + 6*((b^3*c^2*d*g^3 - 2*a*b^2*c*d^2*g^3 + a^2*b*d^3*g^3)*B^2*x
+ (b^3*c^3*g^3 - 2*a*b^2*c^2*d*g^3 + a^2*b*c*d^2*g^3)*B^2)*log(d*x + c))*lo
g((d*x + c)^n)^2/(d^5*x + c*d^4) + integrate(-(B^2*a^3*d^3*g^3 + (2*A*B*b^3
*d^3*g^3 + B^2*b^3*d^3*g^3)*x^3 + 3*(2*A*B*a*b^2*d^3*g^3 + B^2*a*b^2*d^3*g^
3)*x^2 + (B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g
^3*x + B^2*a^3*d^3*g^3)*log((b*x + a)^n)^2 + 3*(2*A*B*a^2*b*d^3*g^3 + B^2*a
^2*b*d^3*g^3)*x + 2*(B^2*a^3*d^3*g^3 + (A*B*b^3*d^3*g^3 + B^2*b^3*d^3*g^3)*
x^3 + 3*(A*B*a*b^2*d^3*g^3 + B^2*a*b^2*d^3*g^3)*x^2 + 3*(A*B*a^2*b*d^3*g^3
+ B^2*a^2*b*d^3*g^3)*x)*log((b*x + a)^n) - ((B^2*b^3*d^3*g^3*(n + 2) + 2*A*
B*b^3*d^3*g^3)*x^3 - 2*(a^3*d^3*g^3*(n - 1) - b^3*c^3*g^3*n + 3*a*b^2*c^2*d
*g^3*n - 3*a^2*b*c*d^2*g^3*n)*B^2 + 3*(2*A*B*a*b^2*d^3*g^3 + (2*a*b^2*d^3*g
^3*(n + 1) - b^3*c*d^2*g^3*n)*B^2)*x^2 + 2*(3*A*B*a^2*b*d^3*g^3 - (2*b^3*c^
2*d*g^3*n - 3*a*b^2*c*d^2*g^3*n - 3*a^2*b*d^3*g^3)*B^2)*x + 6*((b^3*c^2*d*g
^3*n - 2*a*b^2*c*d^2*g^3*n + a^2*b*d^3*g^3*n)*B^2*x + (b^3*c^3*g^3*n - 2*a*
b^2*c^2*d*g^3*n + a^2*b*c*d^2*g^3*n)*B^2)*log(d*x + c) + 2*(B^2*b^3*d^3*g^3
*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*l
og((b*x + a)^n))*log((d*x + c)^n))/(d^5*x^2 + 2*c*d^4*x + c^2*d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] integral(-((A^2 + 2*A*B + B^2)*b^3*g^3*x^3 + 3*(A^2 + 2*A*B + B^2)*a*b^2*g^
3*x^2 + 3*(A^2 + 2*A*B + B^2)*a^2*b*g^3*x + (A^2 + 2*A*B + B^2)*a^3*g^3 + (
```

```
B^2*b^3*g^3*n^2*x^3 + 3*B^2*a*b^2*g^3*n^2*x^2 + 3*B^2*a^2*b*g^3*n^2*x + B^2
*a^3*g^3*n^2)*log((b*x + a)/(d*x + c))^2 + 2*((A*B + B^2)*b^3*g^3*n*x^3 + 3
*(A*B + B^2)*a*b^2*g^3*n*x^2 + 3*(A*B + B^2)*a^2*b*g^3*n*x + (A*B + B^2)*a^
3*g^3*n)*log((b*x + a)/(d*x + c)))/(d^2*x^2 + 2*c*d*x + c^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**2
,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(I*d*x +
 I*c)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{(c\,i+d\,i\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^2,x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^2, x)
```

3.195 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=500

$$-\frac{2AB(bc-ad)g^2n(a+bx)}{d^2i^2(c+dx)}+\frac{2B^2(bc-ad)g^2n^2(a+bx)}{d^2i^2(c+dx)}-\frac{2B^2(bc-ad)g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^2i^2(c+dx)}+\frac{bg^2(a+$$

```
[Out] -2*A*B*(-a*d+b*c)*g^2*n*(b*x+a)/d^2/i^2/(d*x+c)+2*B^2*(-a*d+b*c)*g^2*n^2*(b
*x+a)/d^2/i^2/(d*x+c)-2*B^2*(-a*d+b*c)*g^2*n*(b*x+a)*ln(e*((b*x+a)/(d*x+c))
^n)/d^2/i^2/(d*x+c)+b*g^2*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^2/i^2
+(-a*d+b*c)*g^2*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^2/i^2/(d*x+c)+2
*b*B*(-a*d+b*c)*g^2*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+
c))/d^3/i^2+2*b*(-a*d+b*c)*g^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln((-a*d+b
*c)/b/(d*x+c))/d^3/i^2+2*b*B^2*(-a*d+b*c)*g^2*n^2*polylog(2,d*(b*x+a)/b/(d*
x+c))/d^3/i^2+4*b*B*(-a*d+b*c)*g^2*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*polylo
g(2,d*(b*x+a)/b/(d*x+c))/d^3/i^2-4*b*B^2*(-a*d+b*c)*g^2*n^2*polylog(3,d*(b*
x+a)/b/(d*x+c))/d^3/i^2
```

Rubi [A]
time = 0.34, antiderivative size = 500, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2561, 2395, 2333, 2332, 2355, 2354, 2438, 2421, 6724}

$$\frac{4bBg^2n(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^2}+\frac{2bB^2g^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}-\frac{4bB^2g^2n^2(bc-ad)\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}+\frac{2bg^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^3i^2}+\frac{2bBg^2n(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^2}+\frac{bg^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^2i^2}+\frac{g^2(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^2i^2(c+dx)}-\frac{2ABg^2n(a+bx)(bc-ad)}{d^2i^2(c+dx)}-\frac{2B^2g^2n(a+bx)(bc-ad)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^2i^2(c+dx)}+\frac{2B^2g^2n^2(a+bx)(bc-ad)}{d^2i^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*g^2*n*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B^2*(b*c - a*
d)*g^2*n^2*(a + b*x))/(d^2*i^2*(c + d*x)) - (2*B^2*(b*c - a*d)*g^2*n*(a + b
*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i^2*(c + d*x)) + (b*g^2*(a + b*x)*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^2) + ((b*c - a*d)*g^2*(a +
 b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^2*(c + d*x)) + (2*b*
B*(b*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/
(b*(c + d*x))])/(d^3*i^2) + (2*b*(b*c - a*d)*g^2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^2) + (2*b*B^2*(b*c -
a*d)*g^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2) + (4*b*B*(b
*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b
*x))/(b*(c + d*x))])/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*n^2*PolyLog[3, (d
*(a + b*x))/(b*(c + d*x))])/(d^3*i^2)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(195c+195dx)^2}\,dx = \int \left(\frac{b^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} + \frac{(-bc+ad)^2g^2\left(A+B\log\right.}{38025d^2(c+\right.}$$

$$= \frac{(b^2g^2)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx}{38025d^2} - \frac{(2b(bc-ad)g^2)\int \frac{(A+}{}}{3802}$$

$$= \frac{b^2g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(e\right.\right.}{38025d^3(c+dx)}$$

$$= \frac{b^2g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(e\right.\right.}{38025d^3(c+dx)}$$

$$= \frac{b^2g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(e\right.\right.}{38025d^3(c+dx)}$$

$$= \frac{b^2g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(e\right.\right.}{38025d^3(c+dx)}$$

$$= \frac{2B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38025d^3(c+dx)} + \frac{2abBg^2n\log(a+}{}$$

$$= \frac{2B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38025d^3(c+dx)} + \frac{2abBg^2n\log(a+}{}$$

$$= \frac{2B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38025d^3(c+dx)} + \frac{2abBg^2n\log(a+}{}$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} + \frac{2B}{}$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB}{}$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB}{}$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB}{}$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB}{}$$

$$-\frac{2B^2(bc-ad)^2g^2n^2}{} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{} - \frac{abB}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 2196 vs. $2(500) = 1000$.

time = 3.00, size = 2196, normalized size = 4.39

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x)^2,x]
```

```
[Out] (g^2*(b^2*d*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c
+ d*x)])^2 - ((b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log
[(a + b*x)/(c + d*x)])^2)/(c + d*x) - 2*b*(b*c - a*d)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + (2*a^2*B*
d^2*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)]
)*(b*c - a*d + b*(c + d*x)*Log[a/b + x] + (-(b*c) + a*d)*Log[(a + b*x)/(c +
 d*x)] - b*c*Log[(b*(c + d*x))/(b*c - a*d)] - b*d*x*Log[(b*(c + d*x))/(b*c
- a*d)]))/((-(b*c) + a*d)*(c + d*x)) + 2*a*b*B*d*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-Log[c/d + x]^2 + 2*Log[c/d
+ x]*Log[c + d*x] + 2*(-(c/(c + d*x)) + (b*c*Log[a + b*x])/(-(b*c) + a*d) +
 (b*c*Log[c + d*x])/(b*c - a*d) - Log[a/b + x]*Log[c + d*x] + Log[(a + b*x)
/(c + d*x)]*(c/(c + d*x) + Log[c + d*x]) + Log[a/b + x]*Log[(b*(c + d*x))/(
b*c - a*d)]) + 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*n*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(d*(a/b +
 x)*(-1 + Log[a/b + x]) - (c^2*Log[a/b + x])/(c + d*x) - (c + d*x)*(-1 + Lo
g[c/d + x]) + c*Log[c/d + x]^2 + (c^2*(1 + Log[c/d + x]))/(c + d*x) + (b*c^
2*(Log[a + b*x] - Log[c + d*x]))/(b*c - a*d) + (-Log[a/b + x] + Log[c/d + x
] + Log[(a + b*x)/(c + d*x)])*(d*x - c^2/(c + d*x) - 2*c*Log[c + d*x]) - 2*
c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)])) - (a^2*B^2*d^2*n^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a +
b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*
Log[(a + b*x)/(c + d*x)] + (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 - 2*b*(c
+ d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d
)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c +
d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] +
 Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
))/((b*c - a*d)*(c + d*x)) + b^2*B^2*n^2*((d*(a + b*x)*Log[(a + b*x)/(c + d
*x)]^2)/b - (c^2*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x) + 2*c*Log[(a + b*x)/
(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (c^2*(2*b*c - 2*a*d + 2*b*(c
+ d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x
)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*
(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c +
d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Po
lyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c
```

```
 + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*
d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x))
 - ((b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c
) + a*d)] - 2*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) -
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b + 4*c*(Log[(a + b*x)/(c + d*x)]
*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c +
 d*x))])) + 2*a*b*B^2*d*n^2*((c*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x) - Log
[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*Log[(a + b*x)/(c
 + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(2*b*c - 2*a*d + 2*b*
(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c +
d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2
*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c
 + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2
*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(
b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c +
 b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*
x)) + 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^3*i^2)
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] -2*A*B*a^2*g^2*n*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d -
a*d^2) + 1/(d^2*x + c*d)) + A^2*b^2*(c^2/(d^4*x + c*d^3) - x/d^2 + 2*c*log(
d*x + c)/d^3)*g^2 - 2*A^2*a*b*g^2*(c/(d^3*x + c*d^2) + log(d*x + c)/d^2) +
2*A*B*a^2*g^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(d^2*x + c*d) + A^2*a^
2*g^2/(d^2*x + c*d) - (B^2*b^2*d^2*g^2*x^2 + B^2*b^2*c*d*g^2*x - (b^2*c^2*g
^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*B^2 - 2*((b^2*c*d*g^2 - a*b*d^2*g^2)*B^2*
x + (b^2*c^2*g^2 - a*b*c*d*g^2)*B^2)*log(d*x + c))*log((d*x + c)^n)^2/(d^4*
```

```
x + c*d^3) + integrate(-(B^2*a^2*d^2*g^2 + (2*A*B*b^2*d^2*g^2 + B^2*b^2*d^2
*g^2)*x^2 + (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*l
og((b*x + a)^n)^2 + 2*(2*A*B*a*b*d^2*g^2 + B^2*a*b*d^2*g^2)*x + 2*(B^2*a^2*
d^2*g^2 + (A*B*b^2*d^2*g^2 + B^2*b^2*d^2*g^2)*x^2 + 2*(A*B*a*b*d^2*g^2 + B^
2*a*b*d^2*g^2)*x)*log((b*x + a)^n) + 2*((a^2*d^2*g^2*(n - 1) + b^2*c^2*g^2*
n - 2*a*b*c*d*g^2*n)*B^2 - (B^2*b^2*d^2*g^2*(n + 1) + A*B*b^2*d^2*g^2)*x^2
- (2*A*B*a*b*d^2*g^2 + (b^2*c*d*g^2*n + 2*a*b*d^2*g^2)*B^2)*x + 2*((b^2*c*d
*g^2*n - a*b*d^2*g^2*n)*B^2*x + (b^2*c^2*g^2*n - a*b*c*d*g^2*n)*B^2)*log(d*
x + c) - (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log(
(b*x + a)^n))*log((d*x + c)^n))/(d^4*x^2 + 2*c*d^3*x + c^2*d^2), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] integral(-((A^2 + 2*A*B + B^2)*b^2*g^2*x^2 + 2*(A^2 + 2*A*B + B^2)*a*b*g^2*
x + (A^2 + 2*A*B + B^2)*a^2*g^2 + (B^2*b^2*g^2*n^2*x^2 + 2*B^2*a*b*g^2*n^2*
x + B^2*a^2*g^2*n^2)*log((b*x + a)/(d*x + c))^2 + 2*((A*B + B^2)*b^2*g^2*n*
x^2 + 2*(A*B + B^2)*a*b*g^2*n*x + (A*B + B^2)*a^2*g^2*n)*log((b*x + a)/(d*x
 + c)))/(d^2*x^2 + 2*c*d*x + c^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**2
,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(I*d*x +
 I*c)^2, x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^2\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2}{(c\,i+d\,i\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^2,x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^2, x)
```

3.196 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=282

$$\frac{2ABgn(a+bx)}{di^2(c+dx)}-\frac{2B^2gn^2(a+bx)}{di^2(c+dx)}+\frac{2B^2gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{di^2(c+dx)}-\frac{g(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{di^2(c+dx)}-\frac{bg(}{}$$

```
[Out] 2*A*B*g*n*(b*x+a)/d/i^2/(d*x+c)-2*B^2*g*n^2*(b*x+a)/d/i^2/(d*x+c)+2*B^2*g*n
*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/d/i^2/(d*x+c)-g*(b*x+a)*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))^2/d/i^2/(d*x+c)-b*g*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln((-
a*d+b*c)/b/(d*x+c))/d^2/i^2-2*b*B*g*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*polyl
og(2,d*(b*x+a)/b/(d*x+c))/d^2/i^2+2*b*B^2*g*n^2*polylog(3,d*(b*x+a)/b/(d*x+
c))/d^2/i^2
```

Rubi [A]
time = 0.19, antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.163$, Rules used = {2561, 2395, 2333, 2332, 2354, 2421, 6724}

$$-\frac{2bBgn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i^2}+\frac{2bB^2gn^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2}-\frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^2i^2}-\frac{g(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{di^2(c+dx)}+\frac{2ABgn(a+bx)}{di^2(c+dx)}+\frac{2B^2gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{di^2(c+dx)}-\frac{2B^2gn^2(a+bx)}{di^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x)^
2,x]
```

```
[Out] (2*A*B*g*n*(a + b*x))/(d*i^2*(c + d*x)) - (2*B^2*g*n^2*(a + b*x))/(d*i^2*(c
 + d*x)) + (2*B^2*g*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d*i^2*(c +
 d*x)) - (g*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d*i^2*(c +
 d*x)) - (b*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(
c + d*x))])/(d^2*i^2) - (2*b*B*g*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*P
olyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i^2) + (2*b*B^2*g*n^2*PolyLog[
3, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i^2)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(196c+196dx)^2}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d(c+dx)^2} + \frac{bg\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{38416d(c+}\right.$$

$$= \frac{(bg)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{38416d} - \frac{((bc-ad)g)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{(c+dx)^2}}{38416d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{38416d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{38416d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{38416d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{38416d^2}$$

$$= -\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19208d^2(c+dx)} - \frac{bBgn\log(a+bx)\left(A\right.}{1920}$$

$$= -\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19208d^2(c+dx)} - \frac{bBgn\log(a+bx)\left(A\right.}{1920}$$

$$= -\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19208d^2(c+dx)} - \frac{bBgn\log(a+bx)\left(A\right.}{1920}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} - \frac{B(bc-ad)gn(A+B}{19208d^2(c}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1261 vs. $2(282) = 564$.
time = 1.21, size = 1261, normalized size = 4.47

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d
*i*x)^2,x]
```

```
[Out] (g*(((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/
(c + d*x)])^2)/(c + d*x) + b*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Lo
g[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + (2*a*B*d*n*(-A - B*Log[e*((a + b*x
)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(b*c - a*d + b*(c + d*x)*Lo
g[a/b + x] + (-(b*c) + a*d)*Log[(a + b*x)/(c + d*x)] - b*c*Log[(b*(c + d*x)
)/(b*c - a*d)] - b*d*x*Log[(b*(c + d*x))/(b*c - a*d)]))/((-(b*c) + a*d)*(c
+ d*x)) + b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(
c + d*x)])*(-Log[c/d + x]^2 + 2*Log[c/d + x]*Log[c + d*x] + 2*(-(c/(c + d*x
)) + (b*c*Log[a + b*x])/(-(b*c) + a*d) + (b*c*Log[c + d*x])/(b*c - a*d) - L
og[a/b + x]*Log[c + d*x] + Log[(a + b*x)/(c + d*x)]*(c/(c + d*x) + Log[c +
d*x]) + Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)]) - (a*B^2*d*n^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a
 + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*
x]*Log[(a + b*x)/(c + d*x)] + (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 - 2*b*
(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c -
a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
 + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c
 + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)
] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])))/((b*c - a*d)*(c + d*x)) + b*B^2*n^2*((c*Log[(a + b*x)/(c + d*x)]^2)/(
c + d*x) - Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*Lo
g[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(2*b*c
- 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x
)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Lo
g[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c +
b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*
c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log
[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c
 - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c
- a*d)*(c + d*x)) + 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^2*i^2)
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{(dix+ci)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] -2*A*B*a*g*n*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^
2) + 1/(d^2*x + c*d)) - A^2*b*g*(c/(d^3*x + c*d^2) + log(d*x + c)/d^2) + 2*
A*B*a*g*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(d^2*x + c*d) + A^2*a*g/(d^2
*x + c*d) - ((b*c*g - a*d*g)*B^2 + (B^2*b*d*g*x + B^2*b*c*g)*log(d*x + c))*
log((d*x + c)^n)^2/(d^3*x + c*d^2) + integrate(-(B^2*a*d*g + (B^2*b*d*g*x +
 B^2*a*d*g)*log((b*x + a)^n)^2 + (2*A*B*b*d*g + B^2*b*d*g)*x + 2*(B^2*a*d*g
 + (A*B*b*d*g + B^2*b*d*g)*x)*log((b*x + a)^n) + 2*((a*d*g*(n - 1) - b*c*g*
n)*B^2 - (A*B*b*d*g + B^2*b*d*g)*x - (B^2*b*d*g*n*x + B^2*b*c*g*n)*log(d*x
+ c) - (B^2*b*d*g*x + B^2*a*d*g)*log((b*x + a)^n))*log((d*x + c)^n))/(d^3*x
^2 + 2*c*d^2*x + c^2*d), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] integral(-((A^2 + 2*A*B + B^2)*b*g*x + (A^2 + 2*A*B + B^2)*a*g + (B^2*b*g*n
^2*x + B^2*a*g*n^2)*log((b*x + a)/(d*x + c))^2 + 2*((A*B + B^2)*b*g*n*x + (
A*B + B^2)*a*g*n)*log((b*x + a)/(d*x + c)))/(d^2*x^2 + 2*c*d*x + c^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(I*d*x + I
*c)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{{(c\,i+d\,i\,x)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x)^
2,x)
```

```
[Out] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x)^
2, x)
```

3.197 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=163

$$-\frac{2ABn(a+bx)}{(bc-ad)i^2(c+dx)}+\frac{2B^2n^2(a+bx)}{(bc-ad)i^2(c+dx)}-\frac{2B^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)i^2(c+dx)}+\frac{(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)i^2(c+dx)}$$

```
[Out] -2*A*B*n*(b*x+a)/(-a*d+b*c)/i^2/(d*x+c)+2*B^2*n^2*(b*x+a)/(-a*d+b*c)/i^2/(d
*x+c)-2*B^2*n*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)/i^2/(d*x+c)+(b*x
+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)/i^2/(d*x+c)
```

Rubi [A]
time = 0.06, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.086$, Rules used = {2551, 2333, 2332}

$$\frac{(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^2(c+dx)(bc-ad)}-\frac{2ABn(a+bx)}{i^2(c+dx)(bc-ad)}-\frac{2B^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{i^2(c+dx)(bc-ad)}+\frac{2B^2n^2(a+bx)}{i^2(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x)^2,x]
```

```
[Out] (-2*A*B*n*(a + b*x))/((b*c - a*d)*i^2*(c + d*x)) + (2*B^2*n^2*(a + b*x))/((
b*c - a*d)*i^2*(c + d*x)) - (2*B^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^
n])/((b*c - a*d)*i^2*(c + d*x)) + ((a + b*x)*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^2)/((b*c - a*d)*i^2*(c + d*x))
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2551

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(m +
1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c -
 a*d, 0] && IntegersQ[m, p] && EqQ[d*f - c*g, 0] && (GtQ[p, 0] || LtQ[m, -1
```

])

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(197c+197dx)^2}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c+dx)} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{197(a+bx)(c+dx)^2}\,dx}{197d}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c+dx)} + \frac{(2B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^2}\,dx}{38809d}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c+dx)} + \frac{(2B(bc-ad)n)\int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^2(a+bx)} - \right.}{3}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c+dx)} - \frac{(2Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}\,dx}{38809} - \frac{(2bBn)\int \frac{A}{-}}{3880}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc-ad)}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc-ad)}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc-ad)}$$

$$= -\frac{2B^2n^2}{38809d(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{38809d(bc-ad)} + \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c+dx)} -$$

$$= -\frac{2B^2n^2}{38809d(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{38809d(bc-ad)} - \frac{bB^2n^2\log^2(a+bx)}{38809d(bc-ad)} + \frac{2Bn(A}{3}$$

$$= -\frac{2B^2n^2}{38809d(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{38809d(bc-ad)} - \frac{bB^2n^2\log^2(a+bx)}{38809d(bc-ad)} + \frac{2Bn(A}{3}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.29, size = 331, normalized size = 2.03

$$\frac{-\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + \frac{Bn\left(2(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+2b(c+dx)\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-2b(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)-2Bn(bc-ad+b(c+dx)\log(a+bx)-b(c+dx)\log(c+dx))-bBn(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+bBn(c+dx)\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{bc-ad}}{di^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x)^2,x]
```

```
[Out] (-(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*(b*c - a*d)*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]) + 2*b*(c + d*x)*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) - 2*b*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[c + d*x] - 2*B*n*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*
Log[c + d*x]) - b*B*n*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
 d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*n*
(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(d*i^2*(c + d*x
))
```

Maple [F]
time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(dix+ci\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 376 vs. $2(154) = 308$.
time = 0.31, size = 376, normalized size = 2.31

$$-2\,ABn\left(\frac{b\log\left(bx+a\right)}{bcd-ad^{2}}-\frac{b\log\left(dx+c\right)}{bcd-ad^{2}}+\frac{1}{d^{2}x+cd}\right)-\left(2\,n\left(\frac{b\log\left(bx+a\right)}{bcd-ad^{2}}-\frac{b\log\left(dx+c\right)}{bcd-ad^{2}}+\frac{1}{d^{2}x+cd}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)-\frac{\left((bdx+bc)\log\left(bx+a\right)^{2}+(bdx+bc)\log\left(dx+c\right)^{2}+2\,bc-2\,ad+2\,(bdx+bc)\log\left(bx+a\right)-2\,(bdx+bc+(bdx+bc)\log\left(bx+a\right))\log\left(dx+c\right)\right)n^{2}}{bc^{2}d-acd^{2}+(bcd^{2}-ad^{3})x}\right)B^{2}+\frac{B^{2}\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)^{2}}{d^{2}x+cd}+\frac{2\,AB\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)}{d^{2}x+cd}+\frac{A^{2}}{d^{2}x+cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, algorithm="ma
xima")
```

```
[Out] -2*A*B*n*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(b*c*d - a*d^2) +
 1/(d^2*x + c*d)) - (2*n*(b*log(b*x + a)/(b*c*d - a*d^2) - b*log(d*x + c)/(
b*c*d - a*d^2) + 1/(d^2*x + c*d))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) -
((b*d*x + b*c)*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*
d + 2*(b*d*x + b*c)*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x +
 a))*log(d*x + c))*n^2/(b*c^2*d - a*c*d^2 + (b*c*d^2 - a*d^3)*x))*B^2 + B^2
*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2/(d^2*x + c*d) + 2*A*B*log((b*x/(d
*x + c) + a/(d*x + c))^n*e)/(d^2*x + c*d) + A^2/(d^2*x + c*d)
```

Fricas [A]
time = 0.37, size = 206, normalized size = 1.26

$$\frac{(A^{2}+2\,AB+B^{2})bc-(A^{2}+2\,AB+B^{2})ad+2\,(B^{2}bc-B^{2}ad)n^{2}-(B^{2}bdn^{2}x+B^{2}adn^{2})\log\left(\frac{bx+a}{dx+c}\right)^{2}-2\,((AB+B^{2})bc-(AB+B^{2})ad)n+2\,(B^{2}adn^{2}-(AB+B^{2})adn+(B^{2}bdn^{2}-(AB+B^{2})bdn)x)\log\left(\frac{bx+a}{dx+c}\right)}{bc^{2}d-acd^{2}+(bcd^{2}-ad^{3})x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, algorithm="fr
icas")
```

```
[Out] ((A^2 + 2*A*B + B^2)*b*c - (A^2 + 2*A*B + B^2)*a*d + 2*(B^2*b*c - B^2*a*d)*
n^2 - (B^2*b*d*n^2*x + B^2*a*d*n^2)*log((b*x + a)/(d*x + c))^2 - 2*((A*B +
B^2)*b*c - (A*B + B^2)*a*d)*n + 2*(B^2*a*d*n^2 - (A*B + B^2)*a*d*n + (B^2*b
*d*n^2 - (A*B + B^2)*b*d*n)*x)*log((b*x + a)/(d*x + c)))/(b*c^2*d - a*c*d^2
 + (b*c*d^2 - a*d^3)*x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^2}{c^2+2cdx+d^2x^2}\,dx + \int \frac{B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^2+2cdx+d^2x^2}\,dx + \int \frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^2+2cdx+d^2x^2}\,dx}{i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**2,x)
```

```
[Out] (Integral(A**2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(B**2*log(e*(a/(c
 + d*x) + b*x/(c + d*x))**n)**2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral
(2*A*B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**2 + 2*c*d*x + d**2*x**2)
, x))/i**2
```

Giac [A]
time = 4.63, size = 156, normalized size = 0.96

$$-\left(\frac{(bx+a)B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^2}{dx+c} - \frac{2\,(B^2n^2-ABn-B^2n)(bx+a)\log\left(\frac{bx+a}{dx+c}\right)}{dx+c} + \frac{(2\,B^2n^2-2\,ABn-2\,B^2n+A^2+2\,AB+B^2)(bx+a)}{dx+c}\right)\left(\frac{bc}{(bc-ad)^2} - \frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, algorithm="gi
ac")
```

```
[Out] -((b*x + a)*B^2*n^2*log((b*x + a)/(d*x + c))^2/(d*x + c) - 2*(B^2*n^2 - A*B
*n - B^2*n)*(b*x + a)*log((b*x + a)/(d*x + c))/(d*x + c) + (2*B^2*n^2 - 2*A
*B*n - 2*B^2*n + A^2 + 2*A*B + B^2)*(b*x + a)/(d*x + c))*(b*c/(b*c - a*d)^2
 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 6.27, size = 237, normalized size = 1.45

$$\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\left(\frac{2\,B^2\,n}{x\,d^2\,i^2+c\,d\,i^2} - \frac{2\,A\,B}{x\,d^2\,i^2+c\,d\,i^2}\right) - \ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^2\left(\frac{B^2}{d\,(c\,i^2+d\,i^2\,x)} + \frac{B^2\,b}{d\,i^2\,(a\,d-b\,c)}\right) - \frac{A^2-2\,A\,B\,n+2\,B^2\,n^2}{x\,d^2\,i^2+c\,d\,i^2} + \frac{B\,b\,n\,\mathrm{atan}\left(\frac{\left(2\,b\,d\,x+\frac{a\,d^2\,i^2+b\,c\,d\,i^2}{d\,i^2}\right)\,1{}\mathrm{i}}{a\,d-b\,c}\right)\,(A-B\,n)\,4{}\mathrm{i}}{d\,i^2\,(a\,d-b\,c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*i + d*i*x)^2,x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)*((2*B^2*n)/(d^2*i^2*x + c*d*i^2) - (2*A*B)/(
d^2*i^2*x + c*d*i^2)) - log(e*((a + b*x)/(c + d*x))^n)^2*(B^2/(d*(c*i^2 + d
*i^2*x)) + (B^2*b)/(d*i^2*(a*d - b*c))) - (A^2 + 2*B^2*n^2 - 2*A*B*n)/(d^2*
i^2*x + c*d*i^2) + (B*b*n*atan(((2*b*d*x + (a*d^2*i^2 + b*c*d*i^2)/(d*i^2))
*1i)/(a*d - b*c))*(A - B*n)*4i)/(d*i^2*(a*d - b*c))
```

3.198 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)^2}\,dx$

Optimal. Leaf size=231

$$\frac{2ABdn(a+bx)}{(bc-ad)^2gi^2(c+dx)}-\frac{2B^2dn^2(a+bx)}{(bc-ad)^2gi^2(c+dx)}+\frac{2B^2dn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)^2gi^2(c+dx)}-\frac{d(a+bx)\left(A+B\log\left(e\left(\frac{a+}{c+}\cdots\right.\right.\right.}{(bc-ad)^2gi^2(c+dx\cdots}$$

```
[Out] 2*A*B*d*n*(b*x+a)/(-a*d+b*c)^2/g/i^2/(d*x+c)-2*B^2*d*n^2*(b*x+a)/(-a*d+b*c)
^2/g/i^2/(d*x+c)+2*B^2*d*n*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)^2/g
/i^2/(d*x+c)-d*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^2/g/i^2
/(d*x+c)+1/3*b*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3/B/(-a*d+b*c)^2/g/i^2/n
```

Rubi [A]

time = 0.17, antiderivative size = 231, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2561, 2388, 2339, 30, 2333, 2332}

$$\frac{b\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bgi^2n(bc-ad)^2}-\frac{d(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{gi^2(c+dx)(bc-ad)^2}+\frac{2ABdn(a+bx)}{gi^2(c+dx)(bc-ad)^2}+\frac{2B^2dn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{gi^2(c+dx)(bc-ad)^2}-\frac{2B^2dn^2(a+bx)}{gi^2(c+dx)(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*i*x)^2
),x]
```

```
[Out] (2*A*B*d*n*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) - (2*B^2*d*n^2*(a + b
*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) + (2*B^2*d*n*(a + b*x)*Log[e*((a + b*x
)/(c + d*x))^n])/((b*c - a*d)^2*g*i^2*(c + d*x)) - (d*(a + b*x)*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^2*g*i^2*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2388

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[(d + e*x)^(q - 1)*((a + b*Log[c*x^n])^p/x),
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(198c+198dx)^2(ag+bgx)}\,dx = \int\left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)^2} - \frac{bd(A+}{39204}\right.$$

$$= \frac{b^2\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{39204(bc-ad)^2g} - \frac{(bd)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{39204(bc-ad)^2g} - \frac{d\int\frac{(A+}{}}{392}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g} - \frac{b}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g} - \frac{b}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g} - \frac{b}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g} - \frac{b}{}$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19602(bc-ad)g(c+dx)} - \frac{bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{19602(bc-ad)^2g}$$

$$= -\frac{bB^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39204(bc-ad)^2g} - \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19602(bc-ad)g(c+dx)} - \frac{bBn}{}$$

$$= -\frac{bB^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39204(bc-ad)^2g} - \frac{bB^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.}{39204(bc-ad)^2g}$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} -$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} +$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} +$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} +$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} +$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 789 vs. 2(231) = 462.
time = 0.52, size = 789, normalized size = 3.42

$$\frac{bB^2n^2\log^3\left(\frac{a+bx}{c+dx}\right)}{3(bc-ad)^2gi^2}-\frac{2Bn\log\left(\frac{a+bx}{c+dx}\right)\left(-A+Bn-B\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)\right)}{(bc-ad)gi^2(c+dx)}+\frac{\log^2\left(\frac{a+bx}{c+dx}\right)\left(AbBcn-aB^2dn^2+AbBdnx-bB^2dn^2x+bB^2cn\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)+bB^2dnx\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)\right)}{(bc-ad)^2gi^2(c+dx)}+\frac{A^2-2ABn+2B^2n^2+2AB\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)-2B^2n\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)+B^2\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)^2}{(bc-ad)gi^2(c+dx)}+\frac{b\log(a+bx)\left(A^2-2ABn+2B^2n^2+2AB\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)-2B^2n\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)+B^2\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)^2\right)}{(bc-ad)^2gi^2}-\frac{b\left(A^2-2ABn+2B^2n^2+2AB\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)-2B^2n\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)+B^2\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)^2\right)\log(c+dx)}{(bc-ad)^2gi^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*
i*x)^2),x]
```

```
[Out] (b*B^2*n^2*Log[(a + b*x)/(c + d*x)]^3)/(3*(b*c - a*d)^2*g*i^2) - (2*B*n*Log
[(a + b*x)/(c + d*x)]*(-A + B*n - B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log
[(a + b*x)/(c + d*x)])))/((b*c - a*d)*g*i^2*(c + d*x)) + (Log[(a + b*x)/(c
+ d*x)]^2*(A*b*B*c*n - a*B^2*d*n^2 + A*b*B*d*n*x - b*B^2*d*n^2*x + b*B^2*c*
n*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) + b*B^2*d*n
*x*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])))/((b*c -
a*d)^2*g*i^2*(c + d*x)) + (A^2 - 2*A*B*n + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b
*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - 2*B^2*n*(Log[e*((a + b*x)
/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d
*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)/((b*c - a*d)*g*i^2*(c + d*x)) + (b
*Log[a + b*x]*(A^2 - 2*A*B*n + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x
))^n] - n*Log[(a + b*x)/(c + d*x)]) - 2*B^2*n*(Log[e*((a + b*x)/(c + d*x))^
n] - n*Log[(a + b*x)/(c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*
Log[(a + b*x)/(c + d*x)])^2))/((b*c - a*d)^2*g*i^2) - (b*(A^2 - 2*A*B*n + 2
*B^2*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x
)]) - 2*B^2*n*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])
 + B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)*Log
[c + d*x])/((b*c - a*d)^2*g*i^2)
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx+ag)\,(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 928 vs. 2(216) = 432.
time = 0.36, size = 928, normalized size = 4.02

$$-B^2\left(\frac{b\log(bx+a)}{(b^2c^2-2abcd+a^2d^2)g}-\frac{b\log(dx+c)}{(b^2c^2-2abcd+a^2d^2)g}+\frac{1}{(bcd-ad^2)gx+(bc^2-acd)g}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)^2-2AB\left(\frac{b\log(bx+a)}{(b^2c^2-2abcd+a^2d^2)g}-\frac{b\log(dx+c)}{(b^2c^2-2abcd+a^2d^2)g}+\frac{1}{(bcd-ad^2)gx+(bc^2-acd)g}\right)\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)-\frac{1}{3}\left(\frac{\left((bdx+bc)\log(bx+a)^3-(bdx+bc)\log(dx+c)^3+3(bdx+bc)\log(bx+a)^2+3(bdx+bc+(bdx+bc)\log(bx+a))\log(dx+c)^2+6bc-6ad+6(bdx+bc)\log(bx+a)-3\left(2bdx+(bdx+bc)\log(bx+a)^2+2bc+2(bdx+bc)\log(bx+a)\right)\log(dx+c)\right)n^2}{b^2c^3g-2abc^2dg+a^2cd^2g+(b^2c^2dg-2abcd^2g+a^2d^3g)x}-\frac{3\left((bdx+bc)\log(bx+a)^2+(bdx+bc)\log(dx+c)^2+2bc-2ad+2(bdx+bc)\log(bx+a)-2(bdx+bc+(bdx+bc)\log(bx+a))\log(dx+c)\right)n\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^ne\right)}{b^2c^3g-2abc^2dg+a^2cd^2g+(b^2c^2dg-2abcd^2g+a^2d^3g)x}\right)B^2+\frac{\left((bdx+bc)\log(bx+a)^2+(bdx+bc)\log(dx+c)^2+2bc-2ad+2(bdx+bc)\log(bx+a)-2(bdx+bc+(bdx+bc)\log(bx+a))\log(dx+c)\right)ABn}{b^2c^3g-2abc^2dg+a^2cd^2g+(b^2c^2dg-2abcd^2g+a^2d^3g)x}-A^2\left(\frac{b\log(bx+a)}{(b^2c^2-2abcd+a^2d^2)g}-\frac{b\log(dx+c)}{(b^2c^2-2abcd+a^2d^2)g}+\frac{1}{(bcd-ad^2)gx+(bc^2-acd)g}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] -B^2*(b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) - b*log(d*x + c)/(
(b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) + 1/((b*c*d - a*d^2)*g*x + (b*c^2 - a*c*
d)*g))*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2 - 2*A*B*(b*log(b*x + a)/((b
^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a
^2*d^2)*g) + 1/((b*c*d - a*d^2)*g*x + (b*c^2 - a*c*d)*g))*log((b*x/(d*x + c
) + a/(d*x + c))^n*e) - 1/3*(((b*d*x + b*c)*log(b*x + a)^3 - (b*d*x + b*c)*
log(d*x + c)^3 + 3*(b*d*x + b*c)*log(b*x + a)^2 + 3*(b*d*x + b*c + (b*d*x +
 b*c)*log(b*x + a))*log(d*x + c)^2 + 6*b*c - 6*a*d + 6*(b*d*x + b*c)*log(b*
x + a) - 3*(2*b*d*x + (b*d*x + b*c)*log(b*x + a)^2 + 2*b*c + 2*(b*d*x + b*c
)*log(b*x + a))*log(d*x + c))*n^2/(b^2*c^3*g - 2*a*b*c^2*d*g + a^2*c*d^2*g
+ (b^2*c^2*d*g - 2*a*b*c*d^2*g + a^2*d^3*g)*x) - 3*((b*d*x + b*c)*log(b*x +
 a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log(
b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*n*log
((b*x/(d*x + c) + a/(d*x + c))^n*e)/(b^2*c^3*g - 2*a*b*c^2*d*g + a^2*c*d^2*
g + (b^2*c^2*d*g - 2*a*b*c*d^2*g + a^2*d^3*g)*x))*B^2 + ((b*d*x + b*c)*log(
b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)
*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*
A*B*n/(b^2*c^3*g - 2*a*b*c^2*d*g + a^2*c*d^2*g + (b^2*c^2*d*g - 2*a*b*c*d^2
*g + a^2*d^3*g)*x) - A^2*(b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g
) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g) + 1/((b*c*d - a*d^2)
*g*x + (b*c^2 - a*c*d)*g))
```

Fricas [**A**]
time = 0.46, size = 326, normalized size = 1.41

$$-\frac{(B^2bdn^2x + B^2bcn^2)\log\left(\frac{bx+a}{dx+c}\right)^3 + 3\,(A^2 + 2\,AB + B^2)bc - 3\,(A^2 + 2\,AB + B^2)ad + 6\,(B^2bc - B^2ad)n^2 - 3\,(B^2adn^2 - (AB + B^2)bcn + (B^2bdn^2 - (AB + B^2)bdn)x)\log\left(\frac{bx+a}{dx+c}\right)^2 - 6\,((AB + B^2)bc - (AB + B^2)ad)n + 3\,(2\,B^2adn^2 - 2\,(AB + B^2)adn + (A^2 + 2\,AB + B^2)bc + (2\,B^2bdn^2 - 2\,(AB + B^2)bdn + (A^2 + 2\,AB + B^2)bd)x)\log\left(\frac{bx+a}{dx+c}\right)}{3\,((b^2c^2d - 2\,abcd^2 + a^2d^3)gx + (b^2c^3 - 2\,abc^2d + a^2cd^2)g)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] -1/3*((B^2*b*d*n^2*x + B^2*b*c*n^2)*log((b*x + a)/(d*x + c))^3 + 3*(A^2 + 2
*A*B + B^2)*b*c - 3*(A^2 + 2*A*B + B^2)*a*d + 6*(B^2*b*c - B^2*a*d)*n^2 - 3
*(B^2*a*d*n^2 - (A*B + B^2)*b*c*n + (B^2*b*d*n^2 - (A*B + B^2)*b*d*n)*x)*lo
g((b*x + a)/(d*x + c))^2 - 6*((A*B + B^2)*b*c - (A*B + B^2)*a*d)*n + 3*(2*B
^2*a*d*n^2 - 2*(A*B + B^2)*a*d*n + (A^2 + 2*A*B + B^2)*b*c + (2*B^2*b*d*n^2
 - 2*(A*B + B^2)*b*d*n + (A^2 + 2*A*B + B^2)*b*d)*x)*log((b*x + a)/(d*x + c
)))/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g*x + (b^2*c^3 - 2*a*b*c^2*d + a^2
*c*d^2)*g)
```

Sympy [**F(-1)**] Timed out

time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 4.73, size = 314, normalized size = 1.36

$$-\frac{1}{3}\left(\frac{B^2bn^2\log\left(\frac{bx+a}{dx+c}\right)^3}{bcg-adg}-3\left(\frac{(bx+a)B^2dn^2}{(bcg-adg)(dx+c)}-\frac{ABbn+B^2bn}{bcg-adg}\right)\log\left(\frac{bx+a}{dx+c}\right)^2+\frac{3\left(A^2b+2\,ABb+B^2b\right)\log\left(\frac{bx+a}{dx+c}\right)}{bcg-adg}+\frac{6\left(B^2dn^2-ABdn-B^2dn\right)(bx+a)\log\left(\frac{bx+a}{dx+c}\right)}{(bcg-adg)(dx+c)}-\frac{3\left(2\,B^2dn^2-2\,ABdn-2\,B^2dn+A^2d+2\,ABd+B^2d\right)(bx+a)}{(bcg-adg)(dx+c)}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] -1/3*(B^2*b*n^2*log((b*x + a)/(d*x + c))^3/(b*c*g - a*d*g) - 3*((b*x + a)*B
^2*d*n^2/((b*c*g - a*d*g)*(d*x + c)) - (A*B*b*n + B^2*b*n)/(b*c*g - a*d*g))
*log((b*x + a)/(d*x + c))^2 + 3*(A^2*b + 2*A*B*b + B^2*b)*log((b*x + a)/(d*
x + c))/(b*c*g - a*d*g) + 6*(B^2*d*n^2 - A*B*d*n - B^2*d*n)*(b*x + a)*log((
b*x + a)/(d*x + c))/((b*c*g - a*d*g)*(d*x + c)) - 3*(2*B^2*d*n^2 - 2*A*B*d*
n - 2*B^2*d*n + A^2*d + 2*A*B*d + B^2*d)*(b*x + a)/((b*c*g - a*d*g)*(d*x +
c)))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 5.80, size = 365, normalized size = 1.58

$$\frac{B^2\,b\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^3}{3\,g\,i^2\,n\,\left(a\,d-b\,c\right)^2}-\frac{A^2-2\,A\,B\,n+2\,B^2\,n^2}{\left(a\,d-b\,c\right)\,\left(c\,g\,i^2+d\,g\,i^2\,x\right)}-\frac{2\,B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\,\left(A-B\,n\right)}{\left(a\,d-b\,c\right)\,\left(c\,g\,i^2+d\,g\,i^2\,x\right)}-\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)^2\,\left(\frac{B^2}{\left(a\,d-b\,c\right)\,\left(c\,g\,i^2+d\,g\,i^2\,x\right)}-\frac{B\,b\,\left(A-B\,n\right)}{g\,i^2\,n\,\left(a\,d-b\,c\right)^2}\right)-\frac{b\,\mathrm{atan}\left(\frac{b\,\left(2\,b\,d\,x+\frac{a^2\,d^2\,g\,i^2-b^2\,c^2\,g\,i^2}{g\,i^2\,\left(a\,d-b\,c\right)}\right)\,\left(A^2-2\,A\,B\,n+2\,B^2\,n^2\right)\,1{}\mathrm{i}}{\left(a\,d-b\,c\right)\,\left(b\,A^2-2\,b\,A\,B\,n+2\,b\,B^2\,n^2\right)}\right)\,\left(A^2-2\,A\,B\,n+2\,B^2\,n^2\right)\,2{}\mathrm{i}}{g\,i^2\,\left(a\,d-b\,c\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)*(c*i + d*i*x)^2
),x)
```

```
[Out] (B^2*b*log(e*((a + b*x)/(c + d*x))^n)^3)/(3*g*i^2*n*(a*d - b*c)^2) - (A^2 +
 2*B^2*n^2 - 2*A*B*n)/((a*d - b*c)*(c*g*i^2 + d*g*i^2*x)) - (2*B*log(e*((a
+ b*x)/(c + d*x))^n)*(A - B*n))/((a*d - b*c)*(c*g*i^2 + d*g*i^2*x)) - (b*at
an((b*(2*b*d*x + (a^2*d^2*g*i^2 - b^2*c^2*g*i^2)/(g*i^2*(a*d - b*c)))*(A^2
+ 2*B^2*n^2 - 2*A*B*n)*1i)/((a*d - b*c)*(A^2*b + 2*B^2*b*n^2 - 2*A*B*b*n)))
*(A^2 + 2*B^2*n^2 - 2*A*B*n)*2i)/(g*i^2*(a*d - b*c)^2) - log(e*((a + b*x)/(
c + d*x))^n)^2*(B^2/((a*d - b*c)*(c*g*i^2 + d*g*i^2*x)) - (B*b*(A - B*n))/(
g*i^2*n*(a*d - b*c)^2))
```

3.199 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)^2}\,dx$

Optimal. Leaf size=392

$$-\frac{2ABd^2n(a+bx)}{(bc-ad)^3g^2i^2(c+dx)}+\frac{2B^2d^2n^2(a+bx)}{(bc-ad)^3g^2i^2(c+dx)}-\frac{2b^2B^2n^2(c+dx)}{(bc-ad)^3g^2i^2(a+bx)}-\frac{2B^2d^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)^3g^2i^2(c+dx)}$$

```
[Out] -2*A*B*d^2*n*(b*x+a)/(-a*d+b*c)^3/g^2/i^2/(d*x+c)+2*B^2*d^2*n^2*(b*x+a)/(-a
*d+b*c)^3/g^2/i^2/(d*x+c)-2*b^2*B^2*n^2*(d*x+c)/(-a*d+b*c)^3/g^2/i^2/(b*x+a
)-2*B^2*d^2*n*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)^3/g^2/i^2/(d*x+c
)-2*b^2*B*n*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^2/i^2/(b
*x+a)+d^2*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^2/i^2/(d
*x+c)-b^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^2/i^2/(b
*x+a)-2/3*b*d*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3/B/(-a*d+b*c)^3/g^2/i^2/n
```

Rubi [A]
time = 0.26, antiderivative size = 392, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.178$, Rules used = {2561, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2i^2(a+bx)(bc-ad)^3}-\frac{2b^2Bn(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(a+bx)(bc-ad)^3}+\frac{d^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2i^2(c+dx)(bc-ad)^3}-\frac{2ABd^2n(a+bx)}{g^2i^2(c+dx)(bc-ad)^3}-\frac{2bd\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bg^2i^2n(bc-ad)^3}-\frac{2b^2B^2n^2(c+dx)}{g^2i^2(a+bx)(bc-ad)^3}-\frac{2B^2d^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g^2i^2(c+dx)(bc-ad)^3}+\frac{2B^2d^2n^2(a+bx)}{g^2i^2(c+dx)(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i + d*i*x)
^2),x]
```

```
[Out] (-2*A*B*d^2*n*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) + (2*B^2*d^2*n^2
*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B^2*n^2*(c + d*x))/(
(b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*B^2*d^2*n*(a + b*x)*Log[e*((a + b*x)/
(c + d*x))^n])/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B*n*(c + d*x)*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) + (d
^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^2*i
^2*(c + d*x)) - (b^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((
b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*b*d*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])^3)/(3*B*(b*c - a*d)^3*g^2*i^2*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(199c+199dx)^2(ag+bgx)^2}\,dx = \int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)^2} - \frac{2b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^3g^2(a+bx)} + \cdots\right.$$

$$= -\frac{(2b^2d)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{39601(bc-ad)^3g^2} + \frac{(2bd^2)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{39601(bc-ad)^3g^2} + \cdots$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(\cdots}{\cdots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(\cdots}{\cdots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(\cdots}{\cdots}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(\cdots}{\cdots}$$

$$= -\frac{2bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc-ad)^2g^2(a+bx)} + \frac{2Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc-ad)^2g^2(c+dx)} - \frac{b(\cdots}{39\cdots}$$

$$= \frac{2bB^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39601(bc-ad)^3g^2} - \frac{2bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc-ad)^2g^2(a+bx)} + \cdots$$

$$= \frac{2bB^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39601(bc-ad)^3g^2} + \frac{2bB^2d\log(a+bx)\log^2\left(e\left(\frac{a+b\cdots}{c+d\cdots}\right.\right.}{39601(bc-ad)^3g^2}\cdots$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn\cdots}{39601(\cdots}$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn\cdots}{39601(\cdots}$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn\cdots}{39601(\cdots}$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn\cdots}{39601(\cdots}$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn\cdots}{39601(\cdots}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 870 vs. 2(392) = 784.
time = 0.79, size = 870, normalized size = 2.22

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i +
d*i*x)^2),x]
```

```
[Out] -1/3*(2*b*B^2*d*n^2*(a + b*x)*(c + d*x)*Log[(a + b*x)/(c + d*x)]^3 + 3*B*n*
Log[(a + b*x)/(c + d*x)]^2*(2*a*A*b*c*d + b^2*B*c^2*n - a^2*B*d^2*n + 2*A*b
^2*c*d*x + 2*a*A*b*d^2*x + 2*b^2*B*c*d*n*x - 2*a*b*B*d^2*n*x + 2*A*b^2*d^2*
x^2 + 2*b*B*d*(a + b*x)*(c + d*x)*Log[e*((a + b*x)/(c + d*x))^n] - 2*b*B*d*
n*(a + b*x)*(c + d*x)*Log[(a + b*x)/(c + d*x)]) + 6*B*(b*c - a*d)*n*Log[(a
+ b*x)/(c + d*x)]*(A*b*c + a*A*d + b*B*c*n - a*B*d*n + 2*A*b*d*x + B*(a*d +
 b*(c + 2*d*x))*Log[e*((a + b*x)/(c + d*x))^n] - B*n*(b*c + a*d + 2*b*d*x)*
Log[(a + b*x)/(c + d*x)]) + 6*b*d*(a + b*x)*(c + d*x)*Log[a + b*x]*(A^2 + 2
*B^2*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x
)]) + B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)
+ 3*b*(b*c - a*d)*(c + d*x)*(A^2 + 2*A*B*n + 2*B^2*n^2 + B^2*Log[e*((a + b*
x)/(c + d*x))^n]^2 - 2*B*n*(A + B*n)*Log[(a + b*x)/(c + d*x)] + B^2*n^2*Log
[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(A + B*n - B*n
*Log[(a + b*x)/(c + d*x)])) + 3*d*(b*c - a*d)*(a + b*x)*(A^2 - 2*A*B*n + 2*
B^2*n^2 + B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-A + B*n)*Log[(a +
b*x)/(c + d*x)] + B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)
/(c + d*x))^n]*(-A + B*n + B*n*Log[(a + b*x)/(c + d*x)])) - 6*b*d*(a + b*x)
*(c + d*x)*(A^2 + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log
[(a + b*x)/(c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b
*x)/(c + d*x)])^2)*Log[c + d*x])/((b*c - a*d)^3*g^2*i^2*(a + b*x)*(c + d*x)
)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(bgx+ag\right)^{2}\left(dix+ci\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1854 vs. 2(371) = 742.

time = 0.43, size = 1854, normalized size = 4.73

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] B^2*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*x^2
 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*x + (a*b^2*c^3 - 2*a
^2*b*c^2*d + a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d
 + 3*a^2*b*c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c
^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2))*log((b*x/(d*x + c) + a/(d*x + c))^n*e
)^2 + 2*A*B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)
*g^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*x + (a*b^2*c
^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3
*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2))*log((b*x/(d*x + c) + a/(d*x +
 c))^n*e) + 2/3*((3*b^2*c^2 - 3*a^2*d^2 + (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d
 + a*b*d^2)*x)*log(b*x + a)^3 + 3*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d
^2)*x)*log(b*x + a)*log(d*x + c)^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*
b*d^2)*x)*log(d*x + c)^3 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + a*b*c
*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a) - 3*(2*b^2*d^2*x^2 + 2*a*b*c*d + (
b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*c*d
+ a*b*d^2)*x)*log(d*x + c))*n^2/(a*b^3*c^4*g^2 - 3*a^2*b^2*c^3*d*g^2 + 3*a^
3*b*c^2*d^2*g^2 - a^4*c*d^3*g^2 + (b^4*c^3*d*g^2 - 3*a*b^3*c^2*d^2*g^2 + 3*
a^2*b^2*c*d^3*g^2 - a^3*b*d^4*g^2)*x^2 + (b^4*c^4*g^2 - 2*a*b^3*c^3*d*g^2 +
 2*a^3*b*c*d^3*g^2 - a^4*d^4*g^2)*x) + 3*(b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (
b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*
x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c) - (b^2*d^2
*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*n*log((b*x/(d*x + c
) + a/(d*x + c))^n*e)/(a*b^3*c^4*g^2 - 3*a^2*b^2*c^3*d*g^2 + 3*a^3*b*c^2*d^
2*g^2 - a^4*c*d^3*g^2 + (b^4*c^3*d*g^2 - 3*a*b^3*c^2*d^2*g^2 + 3*a^2*b^2*c*
d^3*g^2 - a^3*b*d^4*g^2)*x^2 + (b^4*c^4*g^2 - 2*a*b^3*c^3*d*g^2 + 2*a^3*b*c
*d^3*g^2 - a^4*d^4*g^2)*x))*B^2 + 2*(b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d
^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 +
 a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c) - (b^2*d^2*x^2
+ a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*A*B*n/(a*b^3*c^4*g^2 - 3
*a^2*b^2*c^3*d*g^2 + 3*a^3*b*c^2*d^2*g^2 - a^4*c*d^3*g^2 + (b^4*c^3*d*g^2 -
 3*a*b^3*c^2*d^2*g^2 + 3*a^2*b^2*c*d^3*g^2 - a^3*b*d^4*g^2)*x^2 + (b^4*c^4*
g^2 - 2*a*b^3*c^3*d*g^2 + 2*a^3*b*c*d^3*g^2 - a^4*d^4*g^2)*x) + A^2*((2*b*d
*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*x^2 + (b^3*c^3
 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d
+ a^3*c*d^2)*g^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*
```

```
c*d^2 - a^3*d^3)*g^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^
2*b*c*d^2 - a^3*d^3)*g^2))
```

Fricas [A]
time = 0.41, size = 740, normalized size = 1.89

$$\frac{3\,(A^2+2\,AB+B^2)b^2c^2-3\,(A^2+2\,AB+B^2)a^2d^2+2\,(B^2b^2d^2n^2x^2+B^2abcdn^2+(B^2b^2cd+B^2abd^2)n^2x)\log\left(\frac{bx+a}{dx+c}\right)^3+6\,(B^2b^2c^2-B^2a^2d^2)n^2+3\,(2\,(AB+B^2)b^2d^2nx^2+2\,(AB+B^2)abcdn+(B^2b^2c^2-B^2a^2d^2)n^2+2\,((B^2b^2cd-B^2abd^2)n^2+((AB+B^2)b^2cd+(AB+B^2)abd^2)n)x)\log\left(\frac{bx+a}{dx+c}\right)^2+6\,((AB+B^2)b^2c^2-2\,(AB+B^2)abcd+(AB+B^2)a^2d^2)n+6\,((A^2+2\,AB+B^2)b^2cd-(A^2+2\,AB+B^2)abd^2+2\,(B^2b^2cd-B^2abd^2)n^2)x+6\,((A^2+2\,AB+B^2)abcd+(B^2b^2c^2+B^2a^2d^2)n^2+(2\,B^2b^2d^2n^2+(A^2+2\,AB+B^2)b^2d^2)x^2+((AB+B^2)b^2c^2-(AB+B^2)a^2d^2)n+((A^2+2\,AB+B^2)b^2cd+(A^2+2\,AB+B^2)abd^2+2\,(B^2b^2cd+B^2abd^2)n^2+2\,((AB+B^2)b^2cd-(AB+B^2)abd^2)n)x)\log\left(\frac{bx+a}{dx+c}\right)}{3\,((b^4c^3d-3\,ab^3c^2d^2+3\,a^2b^2cd^3-a^3bd^4)g^2x^2+(b^4c^4-2\,ab^3c^3d+2\,a^3bcd^3-a^4d^4)g^2x+(ab^3c^4-3\,a^2b^2c^3d+3\,a^3bc^2d^2-a^4cd^3)g^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] 1/3*(3*(A^2 + 2*A*B + B^2)*b^2*c^2 - 3*(A^2 + 2*A*B + B^2)*a^2*d^2 + 2*(B^2
*b^2*d^2*n^2*x^2 + B^2*a*b*c*d*n^2 + (B^2*b^2*c*d + B^2*a*b*d^2)*n^2*x)*log
((b*x + a)/(d*x + c))^3 + 6*(B^2*b^2*c^2 - B^2*a^2*d^2)*n^2 + 3*(2*(A*B + B
^2)*b^2*d^2*n*x^2 + 2*(A*B + B^2)*a*b*c*d*n + (B^2*b^2*c^2 - B^2*a^2*d^2)*n
^2 + 2*((B^2*b^2*c*d - B^2*a*b*d^2)*n^2 + ((A*B + B^2)*b^2*c*d + (A*B + B^2
)*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c))^2 + 6*((A*B + B^2)*b^2*c^2 - 2*(A
*B + B^2)*a*b*c*d + (A*B + B^2)*a^2*d^2)*n + 6*((A^2 + 2*A*B + B^2)*b^2*c*d
 - (A^2 + 2*A*B + B^2)*a*b*d^2 + 2*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2)*x + 6*(
(A^2 + 2*A*B + B^2)*a*b*c*d + (B^2*b^2*c^2 + B^2*a^2*d^2)*n^2 + (2*B^2*b^2*
d^2*n^2 + (A^2 + 2*A*B + B^2)*b^2*d^2)*x^2 + ((A*B + B^2)*b^2*c^2 - (A*B +
B^2)*a^2*d^2)*n + ((A^2 + 2*A*B + B^2)*b^2*c*d + (A^2 + 2*A*B + B^2)*a*b*d^
2 + 2*(B^2*b^2*c*d + B^2*a*b*d^2)*n^2 + 2*((A*B + B^2)*b^2*c*d - (A*B + B^2
)*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c)))/((b^4*c^3*d - 3*a*b^3*c^2*d^2 +
3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^2*x^2 + (b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c
*d^3 - a^4*d^4)*g^2*x + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^
4*c*d^3)*g^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**2
,x)
```

```
[Out] Timed out
```

Giac [A]
time = 257.14, size = 164, normalized size = 0.42

$$\left(\frac{(dx+c)B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^2}{(bx+a)g^2}+\frac{2\,(B^2n^2+ABn+B^2n)(dx+c)\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)g^2}+\frac{(2\,B^2n^2+2\,ABn+2\,B^2n+A^2+2\,AB+B^2)(dx+c)}{(bx+a)g^2}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

```
[Out] ((d*x + c)*B^2*n^2*log((b*x + a)/(d*x + c))^2/((b*x + a)*g^2) + 2*(B^2*n^2
+ A*B*n + B^2*n)*(d*x + c)*log((b*x + a)/(d*x + c))/((b*x + a)*g^2) + (2*B^
2*n^2 + 2*A*B*n + 2*B^2*n + A^2 + 2*A*B + B^2)*(d*x + c)/((b*x + a)*g^2))*(
b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)^2
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{{\left(a\,g+b\,g\,x\right)}^2\,{\left(c\,i+d\,i\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^2*(c*i + d*i*x)
^2),x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^2*(c*i + d*i*x)
^2), x)
```

3.200 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)^2}\,dx$

Optimal. Leaf size=560

$$\frac{2ABd^3n(a+bx)}{(bc-ad)^4g^3i^2(c+dx)}-\frac{2B^2d^3n^2(a+bx)}{(bc-ad)^4g^3i^2(c+dx)}+\frac{6b^2B^2dn^2(c+dx)}{(bc-ad)^4g^3i^2(a+bx)}-\frac{b^3B^2n^2(c+dx)^2}{4(bc-ad)^4g^3i^2(a+bx)^2}+\frac{2B^2d^3n}{(bc}$$

```
[Out] 2*A*B*d^3*n*(b*x+a)/(-a*d+b*c)^4/g^3/i^2/(d*x+c)-2*B^2*d^3*n^2*(b*x+a)/(-a*
d+b*c)^4/g^3/i^2/(d*x+c)+6*b^2*B^2*d*n^2*(d*x+c)/(-a*d+b*c)^4/g^3/i^2/(b*x+
a)-1/4*b^3*B^2*n^2*(d*x+c)^2/(-a*d+b*c)^4/g^3/i^2/(b*x+a)^2+2*B^2*d^3*n*(b*
x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)^4/g^3/i^2/(d*x+c)+6*b^2*B*d*n*(d*
x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^3/i^2/(b*x+a)-1/2*b^3*B
*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^3/i^2/(b*x+a)^2
-d^3*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/g^3/i^2/(d*x+c)
+3*b^2*d*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/g^3/i^2/(b*
x+a)-1/2*b^3*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/g^3/i
^2/(b*x+a)^2+b*d^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3/B/(-a*d+b*c)^4/g^3/i^2
/n
```

Rubi [A]
time = 0.33, antiderivative size = 560, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.178$, Rules used = {2561, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^3(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3i^2(a+bx)^2(bc-ad)^4}-\frac{b^3Bn(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2d(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^3i^2(a+bx)(bc-ad)^4}+\frac{6b^2Bdn(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^2(a+bx)(bc-ad)^4}-\frac{d^3(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^3i^2(c+dx)(bc-ad)^4}+\frac{2ABd^3n(a+bx)}{g^3i^2(c+dx)(bc-ad)^4}+\frac{bd^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{Bg^3i^2n(bc-ad)^4}-\frac{b^3B^2n^2(c+dx)^2}{4g^3i^2(a+bx)^2(bc-ad)^4}+\frac{6b^2B^2dn^2(c+dx)}{g^3i^2(a+bx)(bc-ad)^4}+\frac{2B^2d^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g^3i^2(c+dx)(bc-ad)^4}-\frac{2B^2d^3n^2(a+bx)}{g^3i^2(c+dx)(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i + d*i*x)
^2),x]
```

```
[Out] (2*A*B*d^3*n*(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) - (2*B^2*d^3*n^2*
(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (6*b^2*B^2*d*n^2*(c + d*x))/
((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B^2*n^2*(c + d*x)^2)/(4*(b*c - a*d
)^4*g^3*i^2*(a + b*x)^2) + (2*B^2*d^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x
))^n])/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (6*b^2*B*d*n*(c + d*x)*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B*n
*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^3*i
^2*(a + b*x)^2) - (d^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/
((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*d*(c + d*x)*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*(c + d*x)^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^4*g^3*i^2*(a + b*x
)^2) + (b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(B*(b*c - a*d)^4*g^
3*i^2*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(200c+200dx)^2(ag+bgx)^3}\,dx=\int\left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{40000(bc-ad)^2g^3(a+bx)^3}-\frac{b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)^2}+\frac{3b^2}{4}\right.$$

$$=\frac{(3b^2d^2)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{40000(bc-ad)^4g^3}-\frac{(3bd^3)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{40000(bc-ad)^4g^3}-$$

$$=-\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)}+\frac{d^2(A+}{40000(}$$

$$=-\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)}+\frac{d^2(A+}{40000(}$$

$$=-\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)}+\frac{d^2(A+}{40000(}$$

$$=-\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)}+\frac{d^2(A+}{40000(}$$

$$=-\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bBdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8000(bc-ad)^3g^3(a+bx)}-\frac{Bd^2}{20}$$

$$=-\frac{3bB^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{40000(bc-ad)^4g^3}-\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{80000(bc-ad)^2g^3(a+bx)^2}-$$

$$=-\frac{3bB^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{40000(bc-ad)^4g^3}-\frac{3bB^2d^2\log(a+bx)\log^2(e}{40000(bc-ad)^4g^3}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{}{20000}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{}{20000}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{}{20000}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{}{20000}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{}{20000}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1340 vs. $2(560) = 1120$.
time = 1.17, size = 1340, normalized size = 2.39

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i +
d*i*x)^2),x]
```

```
[Out] (4*b*B^2*d^2*n^2*(a + b*x)^2*(c + d*x)*Log[(a + b*x)/(c + d*x)]^3 + 2*B*n*L
og[(a + b*x)/(c + d*x)]^2*(6*a^2*A*b*c*d^2 - b^3*B*c^3*n + 6*a*b^2*B*c^2*d*
n - 2*a^3*B*d^3*n + 12*a*A*b^2*c*d^2*x + 6*a^2*A*b*d^3*x + 3*b^3*B*c^2*d*n*
x + 12*a*b^2*B*c*d^2*n*x - 6*a^2*b*B*d^3*n*x + 6*A*b^3*c*d^2*x^2 + 12*a*A*b
^2*d^3*x^2 + 9*b^3*B*c*d^2*n*x^2 + 6*A*b^3*d^3*x^3 + 3*b^3*B*d^3*n*x^3 + 6*
b*B*d^2*(a + b*x)^2*(c + d*x)*Log[e*((a + b*x)/(c + d*x))^n] - 6*b*B*d^2*n*
(a + b*x)^2*(c + d*x)*Log[(a + b*x)/(c + d*x)]) + 2*b*d*(b*c - a*d)*(a + b*
x)*(c + d*x)*(4*A^2 + 10*A*B*n + 11*B^2*n^2 + 4*B^2*Log[e*((a + b*x)/(c + d
*x))^n]^2 - 2*B*n*(4*A + 5*B*n)*Log[(a + b*x)/(c + d*x)] + 4*B^2*n^2*Log[(a
 + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(4*A + 5*B*n - 4*
B*n*Log[(a + b*x)/(c + d*x)])) - b*(b*c - a*d)^2*(c + d*x)*(2*A^2 + 2*A*B*n
 + B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log
[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((
a + b*x)/(c + d*x))^n]*(2*A + B*n - 2*B*n*Log[(a + b*x)/(c + d*x)])) + 6*b*
d^2*(a + b*x)^2*(c + d*x)*Log[a + b*x]*(2*A^2 + 2*A*B*n + 5*B^2*n^2 + 2*B^2
*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log[(a + b*x)/(c + d*
x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x)
)^n]*(2*A + B*n - 2*B*n*Log[(a + b*x)/(c + d*x)])) + 2*B*(b*c - a*d)*n*Log[
(a + b*x)/(c + d*x)]*(2*b*d*(a + b*x)*(c + d*x)*(4*A + 5*B*n + 4*B*Log[e*((
a + b*x)/(c + d*x))^n] - 4*B*n*Log[(a + b*x)/(c + d*x)]) - b*(b*c - a*d)*(c
 + d*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n] - 2*B*n*Log[(a + b*
x)/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A - B*n + B*Log[e*((a + b*x)/(c + d*x))
^n] - B*n*Log[(a + b*x)/(c + d*x)])) + 4*d^2*(b*c - a*d)*(a + b*x)^2*(A^2 -
 2*A*B*n + 2*B^2*n^2 + B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-A + B
*n)*Log[(a + b*x)/(c + d*x)] + B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log
[e*((a + b*x)/(c + d*x))^n]*(-A + B*n + B*n*Log[(a + b*x)/(c + d*x)])) - 6*
b*d^2*(a + b*x)^2*(c + d*x)*(2*A^2 + 2*A*B*n + 5*B^2*n^2 + 2*B^2*Log[e*((a
+ b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2
*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A +
 B*n - 2*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c + d*x])/(4*(b*c - a*d)^4*g^3*
i^2*(a + b*x)^2*(c + d*x))
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{\left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(bgx+ag\right)^{3}\left(dix+ci\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 3950 vs. $2(528) = 1056$.
time = 0.72, size = 3950, normalized size = 7.05

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] -1/2*B^2*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3
*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)
*g^3*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2
*a^4*b*d^4)*g^3*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 +
a^4*b*c*d^3 - a^5*d^4)*g^3*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2
*d^2 - a^5*c*d^3)*g^3) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6
*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3) - 6*b*d^2*log(d*x + c)/((b
^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3))
*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2 - A*B*((6*b^2*d^2*x^2 - b^2*c^2 +
 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c
^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*x^3 + (b^5*c^4 - a*b^4*c^3*d -
3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*x^2 + (2*a*b^4*c^4 -
 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*x + (a^2*
b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3) + 6*b*d^2*log
(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a
^4*d^4)*g^3) - 6*b*d^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c
^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3))*log((b*x/(d*x + c) + a/(d*x + c))^n
*e) + 1/4*((b^3*c^3 - 24*a*b^2*c^2*d + 15*a^2*b*c*d^2 + 8*a^3*d^3 - 4*(b^3*
d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^
2*b*d^3)*x)*log(b*x + a)^3 + 4*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*
a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^3 - 30*(b^3*c*
d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*
d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 +
 a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*
x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2
*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c)^2 - 3*(7*b^3*c^2*d + 6*a*
b^2*c*d^2 - 13*a^2*b*d^3)*x - 30*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 +
2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(5*b^3*d
^3*x^3 + 5*a^2*b*c*d^2 + 5*(b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + 2*(b^3*d^3*x^3 +
 a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*
```

```
x)*log(b*x + a)^2 + 5*(2*a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*
b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*lo
g(b*x + a))*log(d*x + c))*n^2/(a^2*b^4*c^5*g^3 - 4*a^3*b^3*c^4*d*g^3 + 6*a^
4*b^2*c^3*d^2*g^3 - 4*a^5*b*c^2*d^3*g^3 + a^6*c*d^4*g^3 + (b^6*c^4*d*g^3 -
4*a*b^5*c^3*d^2*g^3 + 6*a^2*b^4*c^2*d^3*g^3 - 4*a^3*b^3*c*d^4*g^3 + a^4*b^2
*d^5*g^3)*x^3 + (b^6*c^5*g^3 - 2*a*b^5*c^4*d*g^3 - 2*a^2*b^4*c^3*d^2*g^3 +
8*a^3*b^3*c^2*d^3*g^3 - 7*a^4*b^2*c*d^4*g^3 + 2*a^5*b*d^5*g^3)*x^2 + (2*a*b
^5*c^5*g^3 - 7*a^2*b^4*c^4*d*g^3 + 8*a^3*b^3*c^3*d^2*g^3 - 2*a^4*b^2*c^2*d^
3*g^3 - 2*a^5*b*c*d^4*g^3 + a^6*d^5*g^3)*x) + 2*(b^3*c^3 - 12*a*b^2*c^2*d +
 15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^
3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^
3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*
d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(3*b^3*c^2*d -
 2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 +
 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(b^3*d^
3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*
b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (
2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*n*log((b*x/(d*x +
 c) + a/(d*x + c))^n*e)/(a^2*b^4*c^5*g^3 - 4*a^3*b^3*c^4*d*g^3 + 6*a^4*b^2*
c^3*d^2*g^3 - 4*a^5*b*c^2*d^3*g^3 + a^6*c*d^4*g^3 + (b^6*c^4*d*g^3 - 4*a*b^
5*c^3*d^2*g^3 + 6*a^2*b^4*c^2*d^3*g^3 - 4*a^3*b^3*c*d^4*g^3 + a^4*b^2*d^5*g
^3)*x^3 + (b^6*c^5*g^3 - 2*a*b^5*c^4*d*g^3 - 2*a^2*b^4*c^3*d^2*g^3 + 8*a^3*
b^3*c^2*d^3*g^3 - 7*a^4*b^2*c*d^4*g^3 + 2*a^5*b*d^5*g^3)*x^2 + (2*a*b^5*c^5
*g^3 - 7*a^2*b^4*c^4*d*g^3 + 8*a^3*b^3*c^3*d^2*g^3 - 2*a^4*b^2*c^2*d^3*g^3
- 2*a^5*b*c*d^4*g^3 + a^6*d^5*g^3)*x))*B^2 + 1/2*(b^3*c^3 - 12*a*b^2*c^2*d
+ 15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x
^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d
^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2
*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(3*b^3*c^2*d
- 2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2
+ 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(b^3*d
^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2
*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 +
(2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*A*B*n/(a^2*b^4*c
^5*g^3 - 4*a^3*b^3*c^4*d*g^3 + 6*a^4*b^2*c^3*d^2*g^3 - 4*a^5*b*c^2*d^3*g^3
+ a^6*c*d^4*g^3 + (b^6*c^4*d*g^3 - 4*a*b^5*c^3*d^2*g^3 + 6*a^2*b^4*c^2*d^3*
g^3 - 4*a^3*b^3*c*d^4*g^3 + a^4*b^2*d^5*g^3)*x^...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 1520 vs. $2(528) = 1056$.
time = 0.49, size = 1520, normalized size = 2.71

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] 1/4*(2*(A^2 + 2*A*B + B^2)*b^3*c^3 - 12*(A^2 + 2*A*B + B^2)*a*b^2*c^2*d + 6
*(A^2 + 2*A*B + B^2)*a^2*b*c*d^2 + 4*(A^2 + 2*A*B + B^2)*a^3*d^3 - 4*(B^2*b
^3*d^3*n^2*x^3 + B^2*a^2*b*c*d^2*n^2 + (B^2*b^3*c*d^2 + 2*B^2*a*b^2*d^3)*n^
2*x^2 + (2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*n^2*x)*log((b*x + a)/(d*x + c))
^3 + (B^2*b^3*c^3 - 24*B^2*a*b^2*c^2*d + 15*B^2*a^2*b*c*d^2 + 8*B^2*a^3*d^3
)*n^2 - 6*(2*(A^2 + 2*A*B + B^2)*b^3*c*d^2 - 2*(A^2 + 2*A*B + B^2)*a*b^2*d^
3 + 5*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 + 2*((A*B + B^2)*b^3*c*d^2 - (A*B
 + B^2)*a*b^2*d^3)*n)*x^2 - 2*(6*(A*B + B^2)*a^2*b*c*d^2*n + 3*(B^2*b^3*d^3
*n^2 + 2*(A*B + B^2)*b^3*d^3*n)*x^3 - (B^2*b^3*c^3 - 6*B^2*a*b^2*c^2*d + 2*
B^2*a^3*d^3)*n^2 + 3*(3*B^2*b^3*c*d^2*n^2 + 2*((A*B + B^2)*b^3*c*d^2 + 2*(A
*B + B^2)*a*b^2*d^3)*n)*x^2 + 3*((B^2*b^3*c^2*d + 4*B^2*a*b^2*c*d^2 - 2*B^2
*a^2*b*d^3)*n^2 + 2*(2*(A*B + B^2)*a*b^2*c*d^2 + (A*B + B^2)*a^2*b*d^3)*n)*
x)*log((b*x + a)/(d*x + c))^2 + 2*((A*B + B^2)*b^3*c^3 - 12*(A*B + B^2)*a*b
^2*c^2*d + 15*(A*B + B^2)*a^2*b*c*d^2 - 4*(A*B + B^2)*a^3*d^3)*n - 3*(2*(A^
2 + 2*A*B + B^2)*b^3*c^2*d + 4*(A^2 + 2*A*B + B^2)*a*b^2*c*d^2 - 6*(A^2 + 2
*A*B + B^2)*a^2*b*d^3 + (7*B^2*b^3*c^2*d + 6*B^2*a*b^2*c*d^2 - 13*B^2*a^2*b
*d^3)*n^2 + 2*(3*(A*B + B^2)*b^3*c^2*d - 2*(A*B + B^2)*a*b^2*c*d^2 - (A*B +
 B^2)*a^2*b*d^3)*n)*x - 2*(6*(A^2 + 2*A*B + B^2)*a^2*b*c*d^2 + 3*(5*B^2*b^3
*d^3*n^2 + 2*(A*B + B^2)*b^3*d^3*n + 2*(A^2 + 2*A*B + B^2)*b^3*d^3)*x^3 - (
B^2*b^3*c^3 - 12*B^2*a*b^2*c^2*d - 4*B^2*a^3*d^3)*n^2 + 3*(6*(A*B + B^2)*b^
3*c*d^2*n + 2*(A^2 + 2*A*B + B^2)*b^3*c*d^2 + 4*(A^2 + 2*A*B + B^2)*a*b^2*d
^3 + (7*B^2*b^3*c*d^2 + 8*B^2*a*b^2*d^3)*n^2)*x^2 - 2*((A*B + B^2)*b^3*c^3
- 6*(A*B + B^2)*a*b^2*c^2*d + 2*(A*B + B^2)*a^3*d^3)*n + 3*(4*(A^2 + 2*A*B
+ B^2)*a*b^2*c*d^2 + 2*(A^2 + 2*A*B + B^2)*a^2*b*d^3 + (3*B^2*b^3*c^2*d + 8
*B^2*a*b^2*c*d^2 + 4*B^2*a^2*b*d^3)*n^2 + 2*((A*B + B^2)*b^3*c^2*d + 4*(A*B
 + B^2)*a*b^2*c*d^2 - 2*(A*B + B^2)*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c
)))/((b^6*c^4*d - 4*a*b^5*c^3*d^2 + 6*a^2*b^4*c^2*d^3 - 4*a^3*b^3*c*d^4 + a
^4*b^2*d^5)*g^3*x^3 + (b^6*c^5 - 2*a*b^5*c^4*d - 2*a^2*b^4*c^3*d^2 + 8*a^3*
b^3*c^2*d^3 - 7*a^4*b^2*c*d^4 + 2*a^5*b*d^5)*g^3*x^2 + (2*a*b^5*c^5 - 7*a^2
*b^4*c^4*d + 8*a^3*b^3*c^3*d^2 - 2*a^4*b^2*c^2*d^3 - 2*a^5*b*c*d^4 + a^6*d^
5)*g^3*x + (a^2*b^4*c^5 - 4*a^3*b^3*c^4*d + 6*a^4*b^2*c^3*d^2 - 4*a^5*b*c^2
*d^3 + a^6*c*d^4)*g^3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**2
,x)
```

```
[Out] Timed out
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**B**]
time = 10.28, size = 1784, normalized size = 3.19

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^3*(c*i + d*i*x)
^2),x)
```

```
[Out] (B^2*b*d^2*log(e*((a + b*x)/(c + d*x))^n)^3)/(g^3*i^2*n*(a*d - b*c)^4) - lo
g(e*((a + b*x)/(c + d*x))^n)^2*(((B^2*(2*a*d + b*c))/(2*(a^2*d^2 + b^2*c^2
- 2*a*b*c*d)) + (3*B^2*b*d*x)/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)))/(x*(a^2*
d*g^3*i^2 + 2*a*b*c*g^3*i^2) + x^2*(b^2*c*g^3*i^2 + 2*a*b*d*g^3*i^2) + a^2*
c*g^3*i^2 + b^2*d*g^3*i^2*x^3) - (3*B*b*d^2*(2*A + B*n))/(2*g^3*i^2*n*(a*d
- b*c)^4) + (3*B^2*b*d^2*(b*g^3*i^2*n*x^2*(a*d - b*c) + (a*c*g^3*i^2*n*(a*d
 - b*c))/d + (g^3*i^2*n*x*(a*d + b*c)*(a*d - b*c))/d))/(g^3*i^2*n*(a*d - b*
c)^4*(x*(a^2*d*g^3*i^2 + 2*a*b*c*g^3*i^2) + x^2*(b^2*c*g^3*i^2 + 2*a*b*d*g^
3*i^2) + a^2*c*g^3*i^2 + b^2*d*g^3*i^2*x^3))) - ((4*A^2*a^2*d^2 - 2*A^2*b^2
*c^2 + 8*B^2*a^2*d^2*n^2 - B^2*b^2*c^2*n^2 + 10*A^2*a*b*c*d - 8*A*B*a^2*d^2
*n - 2*A*B*b^2*c^2*n + 23*B^2*a*b*c*d*n^2 + 22*A*B*a*b*c*d*n)/(2*(a*d - b*c
)) + (3*x^2*(2*A^2*b^2*d^2 + 5*B^2*b^2*d^2*n^2 + 2*A*B*b^2*d^2*n))/(a*d - b
*c) + (3*x*(6*A^2*a*b*d^2 + 2*A^2*b^2*c*d + 13*B^2*a*b*d^2*n^2 + 7*B^2*b^2*
c*d*n^2 + 2*A*B*a*b*d^2*n + 6*A*B*b^2*c*d*n))/(2*(a*d - b*c)))/(x*(2*a^4*d^
3*g^3*i^2 + 4*a*b^3*c^3*g^3*i^2 - 6*a^2*b^2*c^2*d*g^3*i^2) + x^2*(2*b^4*c^3
*g^3*i^2 + 4*a^3*b*d^3*g^3*i^2 - 6*a^2*b^2*c*d^2*g^3*i^2) + x^3*(2*a^2*b^2*
d^3*g^3*i^2 + 2*b^4*c^2*d*g^3*i^2 - 4*a*b^3*c*d^2*g^3*i^2) + 2*a^2*b^2*c^3*
g^3*i^2 + 2*a^4*c*d^2*g^3*i^2 - 4*a^3*b*c^2*d*g^3*i^2) - (b*d^2*atan((b*d^2
*(2*A^2 + 5*B^2*n^2 + 2*A*B*n)*(2*a^4*d^4*g^3*i^2 - 2*b^4*c^4*g^3*i^2 + 4*a
*b^3*c^3*d*g^3*i^2 - 4*a^3*b*c*d^3*g^3*i^2)*3i)/(2*g^3*i^2*(a*d - b*c)^4*(6
*A^2*b*d^2 + 15*B^2*b*d^2*n^2 + 6*A*B*b*d^2*n)) + (b^2*d^3*x*(2*A^2 + 5*B^2
*n^2 + 2*A*B*n)*(a^3*d^3*g^3*i^2 - b^3*c^3*g^3*i^2 + 3*a*b^2*c^2*d*g^3*i^2
- 3*a^2*b*c*d^2*g^3*i^2)*6i)/(g^3*i^2*(a*d - b*c)^4*(6*A^2*b*d^2 + 15*B^2*b
*d^2*n^2 + 6*A*B*b*d^2*n)))*(2*A^2 + 5*B^2*n^2 + 2*A*B*n)*3i)/(g^3*i^2*(a*d
 - b*c)^4) - log(e*((a + b*x)/(c + d*x))^n)*(((B^2*b*c*n)/2 - 2*B^2*a*d*n -
```

```
 x*((3*B^2*b*d*n)/2 - 3*A*B*b*d) + 2*A*B*a*d + A*B*b*c)/(x*(a^4*d^3*g^3*i^2
 + 2*a*b^3*c^3*g^3*i^2 - 3*a^2*b^2*c^2*d*g^3*i^2) + x^2*(b^4*c^3*g^3*i^2 +
2*a^3*b*d^3*g^3*i^2 - 3*a^2*b^2*c*d^2*g^3*i^2) + x^3*(a^2*b^2*d^3*g^3*i^2 +
 b^4*c^2*d*g^3*i^2 - 2*a*b^3*c*d^2*g^3*i^2) + a^2*b^2*c^3*g^3*i^2 + a^4*c*d
^2*g^3*i^2 - 2*a^3*b*c^2*d*g^3*i^2) + (3*B*b*d^2*(2*A + B*n)*(b*g^3*i^2*n*x
^2*(a*d - b*c)^3 + (g^3*i^2*n*x*(a*d + b*c)*(a*d - b*c)^3)/d + (a*c*g^3*i^2
*n*(a*d - b*c)^3)/d))/(g^3*i^2*n*(a*d - b*c)^4*(x*(a^4*d^3*g^3*i^2 + 2*a*b^
3*c^3*g^3*i^2 - 3*a^2*b^2*c^2*d*g^3*i^2) + x^2*(b^4*c^3*g^3*i^2 + 2*a^3*b*d
^3*g^3*i^2 - 3*a^2*b^2*c*d^2*g^3*i^2) + x^3*(a^2*b^2*d^3*g^3*i^2 + b^4*c^2*
d*g^3*i^2 - 2*a*b^3*c*d^2*g^3*i^2) + a^2*b^2*c^3*g^3*i^2 + a^4*c*d^2*g^3*i^
2 - 2*a^3*b*c^2*d*g^3*i^2)))
```

3.201 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)^2}\,dx$

Optimal. Leaf size=729

$$-\frac{2ABd^4n(a+bx)}{(bc-ad)^5g^4i^2(c+dx)}+\frac{2B^2d^4n^2(a+bx)}{(bc-ad)^5g^4i^2(c+dx)}-\frac{12b^2B^2d^2n^2(c+dx)}{(bc-ad)^5g^4i^2(a+bx)}+\frac{b^3B^2dn^2(c+dx)^2}{(bc-ad)^5g^4i^2(a+bx)^2}-\frac{2b^4}{27(bc-}$$

```
[Out] -2*A*B*d^4*n*(b*x+a)/(-a*d+b*c)^5/g^4/i^2/(d*x+c)+2*B^2*d^4*n^2*(b*x+a)/(-a
*d+b*c)^5/g^4/i^2/(d*x+c)-12*b^2*B^2*d^2*n^2*(d*x+c)/(-a*d+b*c)^5/g^4/i^2/(
b*x+a)+b^3*B^2*d*n^2*(d*x+c)^2/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^2-2/27*b^4*B^2*
n^2*(d*x+c)^3/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^3-2*B^2*d^4*n*(b*x+a)*ln(e*((b*x
+a)/(d*x+c))^n)/(-a*d+b*c)^5/g^4/i^2/(d*x+c)-12*b^2*B*d^2*n*(d*x+c)*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^4/i^2/(b*x+a)+2*b^3*B*d*n*(d*x+c)^2
*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^2-2/9*b^4*B*n
*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^4/i^2/(b*x+a)^3+d
^4*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^5/g^4/i^2/(d*x+c)-6
*b^2*d^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^5/g^4/i^2/(b*
x+a)+2*b^3*d*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^5/g^4/i
^2/(b*x+a)^2-1/3*b^4*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)
^5/g^4/i^2/(b*x+a)^3-4/3*b*d^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3/B/(-a*d+b*
c)^5/g^4/i^2/n
```

Rubi [A]
time = 0.40, antiderivative size = 729, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.178$, Rules used = {2561, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^4(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^4i^2(a+bx)^3(bc-ad)^5}-\frac{2b^4Bn(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^4i^2(a+bx)^3(bc-ad)^5}+\frac{2b^3d(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^4i^2(a+bx)^2(bc-ad)^5}+\frac{2b^3Bdn(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(a+bx)^2(bc-ad)^5}-\frac{6b^2d^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^4i^2(a+bx)(bc-ad)^5}-\frac{12b^2Bd^2n(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5}+\frac{d^4(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^4i^2(c+dx)(bc-ad)^5}-\frac{2ABd^4n(a+bx)}{g^4i^2(c+dx)(bc-ad)^5}-\frac{4bd^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bg^4i^2n(bc-ad)^5}-\frac{2b^4B^2n^2(c+dx)^3}{27g^4i^2(a+bx)^3(bc-ad)^5}+\frac{b^3B^2dn^2(c+dx)^2}{g^4i^2(a+bx)^2(bc-ad)^5}-\frac{12b^2B^2d^2n^2(c+dx)}{g^4i^2(a+bx)(bc-ad)^5}-\frac{2B^2d^4n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g^4i^2(c+dx)(bc-ad)^5}+\frac{2B^2d^4n^2(a+bx)}{g^4i^2(c+dx)(bc-ad)^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i + d*i*x)
^2),x]
```

```
[Out] (-2*A*B*d^4*n*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) + (2*B^2*d^4*n^2
*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (12*b^2*B^2*d^2*n^2*(c + d*
x))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (b^3*B^2*d*n^2*(c + d*x)^2)/((b*c -
 a*d)^5*g^4*i^2*(a + b*x)^2) - (2*b^4*B^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)^
5*g^4*i^2*(a + b*x)^3) - (2*B^2*d^4*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))
^n])/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (12*b^2*B*d^2*n*(c + d*x)*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*
B*d*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^
4*i^2*(a + b*x)^2) - (2*b^4*B*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(9*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3) + (d^4*(a + b*x)*(A + B*Log[
```

```
e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (6*b^2*d
^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^4*i
^2*(a + b*x)) + (2*b^3*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2)/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2) - (b^4*(c + d*x)^3*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3) - (4*b*d^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^5*g^4*i^2*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
```

```
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(201c+201dx)^2(ag+bgx)^4}\,dx=-\frac{2bB^2n^2}{1090827(bc-ad)^2g^4(a+bx)^3}+\frac{7bB^2dn^2}{363609(bc-ad)^3g^4(a+bx)^2}-\frac{}{363}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1695 vs. 2(729) = 1458.
time = 1.81, size = 1695, normalized size = 2.33

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i +
d*i*x)^2),x]
```

```
[Out] -1/27*(36*b*B^2*d^3*n^2*(a + b*x)^3*(c + d*x)*Log[(a + b*x)/(c + d*x)]^3 +
9*B*n*Log[(a + b*x)/(c + d*x)]^2*(12*a^3*A*b*c*d^3 + b^4*B*c^4*n - 6*a*b^3*
B*c^3*d*n + 18*a^2*b^2*B*c^2*d^2*n - 3*a^4*B*d^4*n + 36*a^2*A*b^2*c*d^3*x +
 12*a^3*A*b*d^4*x - 2*b^4*B*c^3*d*n*x + 18*a*b^3*B*c^2*d^2*n*x + 36*a^2*b^2
*B*c*d^3*n*x - 12*a^3*b*B*d^4*n*x + 36*a*A*b^3*c*d^3*x^2 + 36*a^2*A*b^2*d^4
*x^2 + 6*b^4*B*c^2*d^2*n*x^2 + 54*a*b^3*B*c*d^3*n*x^2 + 12*A*b^4*c*d^3*x^3
+ 36*a*A*b^3*d^4*x^3 + 22*b^4*B*c*d^3*n*x^3 + 18*a*b^3*B*d^4*n*x^3 + 12*A*b
^4*d^4*x^4 + 10*b^4*B*d^4*n*x^4 + 12*b*B*d^3*(a + b*x)^3*(c + d*x)*Log[e*((
a + b*x)/(c + d*x))^n] - 12*b*B*d^3*n*(a + b*x)^3*(c + d*x)*Log[(a + b*x)/(
c + d*x)]) + 3*b*d^2*(b*c - a*d)*(a + b*x)^2*(c + d*x)*(27*A^2 + 78*A*B*n +
 92*B^2*n^2 + 27*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(9*A + 13*B*n
)*Log[(a + b*x)/(c + d*x)] + 27*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Lo
g[e*((a + b*x)/(c + d*x))^n]*(9*A + 13*B*n - 9*B*n*Log[(a + b*x)/(c + d*x)]
)) + 6*b*d^3*(a + b*x)^3*(c + d*x)*Log[a + b*x]*(18*A^2 + 30*A*B*n + 55*B^2
```

```
*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 5*B*n)*Log[(a
 + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a
+ b*x)/(c + d*x))^n]*(6*A + 5*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) + b*(b
*c - a*d)^3*(c + d*x)*(9*A^2 + 6*A*B*n + 2*B^2*n^2 + 9*B^2*Log[e*((a + b*x)
/(c + d*x))^n]^2 - 6*B*n*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] + 9*B^2*n^2*L
og[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n -
 3*B*n*Log[(a + b*x)/(c + d*x)])) - 3*b*d*(b*c - a*d)^2*(a + b*x)*(c + d*x)
*(9*A^2 + 12*A*B*n + 7*B^2*n^2 + 9*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6
*B*n*(3*A + 2*B*n)*Log[(a + b*x)/(c + d*x)] + 9*B^2*n^2*Log[(a + b*x)/(c +
d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + 2*B*n - 3*B*n*Log[(a +
b*x)/(c + d*x)])) + 6*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d*x)]*(3*b*d^2*(a
+ b*x)^2*(c + d*x)*(9*A + 13*B*n + 9*B*Log[e*((a + b*x)/(c + d*x))^n] - 9*B
*n*Log[(a + b*x)/(c + d*x)]) + b*(b*c - a*d)^2*(c + d*x)*(3*A + B*n + 3*B*L
og[e*((a + b*x)/(c + d*x))^n] - 3*B*n*Log[(a + b*x)/(c + d*x)]) - 3*b*d*(b*
c - a*d)*(a + b*x)*(c + d*x)*(3*A + 2*B*n + 3*B*Log[e*((a + b*x)/(c + d*x))
^n] - 3*B*n*Log[(a + b*x)/(c + d*x)]) + 9*d^3*(a + b*x)^3*(A - B*n + B*Log[
e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])) + 27*d^3*(b*c -
 a*d)*(a + b*x)^3*(A^2 - 2*A*B*n + 2*B^2*n^2 + B^2*Log[e*((a + b*x)/(c + d*
x))^n]^2 + 2*B*n*(-A + B*n)*Log[(a + b*x)/(c + d*x)] + B^2*n^2*Log[(a + b*x
)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-A + B*n + B*n*Log[(a
+ b*x)/(c + d*x)])) - 6*b*d^3*(a + b*x)^3*(c + d*x)*(18*A^2 + 30*A*B*n + 55
*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 5*B*n)*Lo
g[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*
((a + b*x)/(c + d*x))^n]*(6*A + 5*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)]))*Lo
g[c + d*x])/((b*c - a*d)^5*g^4*i^2*(a + b*x)^3*(c + d*x))
```

Maple [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{\left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(bgx + ag\right)^{4}\left(dix + ci\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 5823 vs. 2(690) = 1380.
time = 0.92, size = 5823, normalized size = 7.99

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] 1/3*B^2*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3
*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*
a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4
*c*d^4 + a^4*b^3*d^5)*g^4*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2
+ 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*x^3 + 3*(a*b^6
*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*
c*d^4 + a^6*b*d^5)*g^4*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3
*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*x + (a^3*b^4*c^5
- 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4) +
 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*
a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4) - 12*b*d^3*log(d*x + c)/((b
^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*
c*d^4 - a^5*d^5)*g^4))*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2 + 2/3*A*B*(
(12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*
(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^2*b*d^3
)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 +
a^4*b^3*d^5)*g^4*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*
b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*x^3 + 3*(a*b^6*c^5 - 3*
a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a
^6*b*d^5)*g^4*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2
- 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*x + (a^3*b^4*c^5 - 4*a^4*b
^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4) + 12*b*d^3
*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c
^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4) - 12*b*d^3*log(d*x + c)/((b^5*c^5 -
5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a
^5*d^5)*g^4))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/27*((2*b^4*c^4 - 2
7*a*b^3*c^3*d + 324*a^2*b^2*c^2*d^2 - 245*a^3*b*c*d^3 - 54*a^4*d^4 + 330*(b
^4*c*d^3 - a*b^3*d^4)*x^3 + 36*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*
a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3
*b*d^4)*x)*log(b*x + a)^3 - 36*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*
a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3
*b*d^4)*x)*log(d*x + c)^3 + 15*(17*b^4*c^2*d^2 + 32*a*b^3*c*d^3 - 49*a^2*b^
2*d^4)*x^2 - 90*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3
+ 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(
b*x + a)^2 - 18*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3*a*b^3*d^4
)*x^3 + 15*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 + a^3*b*d^4
)*x - 6*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b
^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)
)*log(d*x + c)^2 - (19*b^4*c^3*d - 567*a*b^3*c^2*d^2 + 87*a^2*b^2*c*d^3 + 4
61*a^3*b*d^4)*x + 330*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4
)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x
)*log(b*x + a) - 6*(55*b^4*d^4*x^4 + 55*a^3*b*c*d^3 + 55*(b^4*c*d^3 + 3*a*b
^3*d^4)*x^3 + 165*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 18*(b^4*d^4*x^4 + a^3*b
*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2
+ (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^2 + 55*(3*a^2*b^2*c*d^3 + a
```

```
^3*b*d^4)*x - 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3
 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log
(b*x + a))*log(d*x + c))*n^2/(a^3*b^5*c^6*g^4 - 5*a^4*b^4*c^5*d*g^4 + 10*a^
5*b^3*c^4*d^2*g^4 - 10*a^6*b^2*c^3*d^3*g^4 + 5*a^7*b*c^2*d^4*g^4 - a^8*c*d^
5*g^4 + (b^8*c^5*d*g^4 - 5*a*b^7*c^4*d^2*g^4 + 10*a^2*b^6*c^3*d^3*g^4 - 10*
a^3*b^5*c^2*d^4*g^4 + 5*a^4*b^4*c*d^5*g^4 - a^5*b^3*d^6*g^4)*x^4 + (b^8*c^6
*g^4 - 2*a*b^7*c^5*d*g^4 - 5*a^2*b^6*c^4*d^2*g^4 + 20*a^3*b^5*c^3*d^3*g^4 -
 25*a^4*b^4*c^2*d^4*g^4 + 14*a^5*b^3*c*d^5*g^4 - 3*a^6*b^2*d^6*g^4)*x^3 + 3
*(a*b^7*c^6*g^4 - 4*a^2*b^6*c^5*d*g^4 + 5*a^3*b^5*c^4*d^2*g^4 - 5*a^5*b^3*c
^2*d^4*g^4 + 4*a^6*b^2*c*d^5*g^4 - a^7*b*d^6*g^4)*x^2 + (3*a^2*b^6*c^6*g^4
- 14*a^3*b^5*c^5*d*g^4 + 25*a^4*b^4*c^4*d^2*g^4 - 20*a^5*b^3*c^3*d^3*g^4 +
5*a^6*b^2*c^2*d^4*g^4 + 2*a^7*b*c*d^5*g^4 - a^8*d^6*g^4)*x) + 6*(b^4*c^4 -
9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*a^3*b*c*d^3 + 9*a^4*d^4 + 30*(b^4*c
*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^2 + 8*a*b^3*c*d^3 - 19*a^2*b^2*d^4)
*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a
*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x +
a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a
*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(d*x +
c)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 + 57*a^2*b^2*c*d^3 + 19*a^3*b*d^4)*x
 + 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3
*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a) -
 6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 2351 vs. $2(690) = 1380$.
time = 0.45, size = 2351, normalized size = 3.22

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] 1/27*(9*(A^2 + 2*A*B + B^2)*b^4*c^4 - 54*(A^2 + 2*A*B + B^2)*a*b^3*c^3*d +
162*(A^2 + 2*A*B + B^2)*a^2*b^2*c^2*d^2 - 90*(A^2 + 2*A*B + B^2)*a^3*b*c*d^
3 - 27*(A^2 + 2*A*B + B^2)*a^4*d^4 + 6*(18*(A^2 + 2*A*B + B^2)*b^4*c*d^3 -
18*(A^2 + 2*A*B + B^2)*a*b^3*d^4 + 55*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*n^2 +
 30*((A*B + B^2)*b^4*c*d^3 - (A*B + B^2)*a*b^3*d^4)*n)*x^3 + 36*(B^2*b^4*d^
4*n^2*x^4 + B^2*a^3*b*c*d^3*n^2 + (B^2*b^4*c*d^3 + 3*B^2*a*b^3*d^4)*n^2*x^3
 + 3*(B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*n^2*x^2 + (3*B^2*a^2*b^2*c*d^3 + B
^2*a^3*b*d^4)*n^2*x)*log((b*x + a)/(d*x + c))^3 + (2*B^2*b^4*c^4 - 27*B^2*a
*b^3*c^3*d + 324*B^2*a^2*b^2*c^2*d^2 - 245*B^2*a^3*b*c*d^3 - 54*B^2*a^4*d^4
)*n^2 + 3*(18*(A^2 + 2*A*B + B^2)*b^4*c^2*d^2 + 72*(A^2 + 2*A*B + B^2)*a*b^
3*c*d^3 - 90*(A^2 + 2*A*B + B^2)*a^2*b^2*d^4 + 5*(17*B^2*b^4*c^2*d^2 + 32*B
^2*a*b^3*c*d^3 - 49*B^2*a^2*b^2*d^4)*n^2 + 6*(11*(A*B + B^2)*b^4*c^2*d^2 +
```

```
8*(A*B + B^2)*a*b^3*c*d^3 - 19*(A*B + B^2)*a^2*b^2*d^4)*n)*x^2 + 9*(12*(A*B
 + B^2)*a^3*b*c*d^3*n + 2*(5*B^2*b^4*d^4*n^2 + 6*(A*B + B^2)*b^4*d^4*n)*x^4
 + 2*((11*B^2*b^4*c*d^3 + 9*B^2*a*b^3*d^4)*n^2 + 6*((A*B + B^2)*b^4*c*d^3 +
 3*(A*B + B^2)*a*b^3*d^4)*n)*x^3 + (B^2*b^4*c^4 - 6*B^2*a*b^3*c^3*d + 18*B^
2*a^2*b^2*c^2*d^2 - 3*B^2*a^4*d^4)*n^2 + 6*((B^2*b^4*c^2*d^2 + 9*B^2*a*b^3*
c*d^3)*n^2 + 6*((A*B + B^2)*a*b^3*c*d^3 + (A*B + B^2)*a^2*b^2*d^4)*n)*x^2 -
 2*((B^2*b^4*c^3*d - 9*B^2*a*b^3*c^2*d^2 - 18*B^2*a^2*b^2*c*d^3 + 6*B^2*a^3
*b*d^4)*n^2 - 6*(3*(A*B + B^2)*a^2*b^2*c*d^3 + (A*B + B^2)*a^3*b*d^4)*n)*x)
*log((b*x + a)/(d*x + c))^2 + 6*((A*B + B^2)*b^4*c^4 - 9*(A*B + B^2)*a*b^3*
c^3*d + 54*(A*B + B^2)*a^2*b^2*c^2*d^2 - 55*(A*B + B^2)*a^3*b*c*d^3 + 9*(A*
B + B^2)*a^4*d^4)*n - (18*(A^2 + 2*A*B + B^2)*b^4*c^3*d - 162*(A^2 + 2*A*B
+ B^2)*a*b^3*c^2*d^2 - 54*(A^2 + 2*A*B + B^2)*a^2*b^2*c*d^3 + 198*(A^2 + 2*
A*B + B^2)*a^3*b*d^4 + (19*B^2*b^4*c^3*d - 567*B^2*a*b^3*c^2*d^2 + 87*B^2*a
^2*b^2*c*d^3 + 461*B^2*a^3*b*d^4)*n^2 + 6*(5*(A*B + B^2)*b^4*c^3*d - 81*(A*
B + B^2)*a*b^3*c^2*d^2 + 57*(A*B + B^2)*a^2*b^2*c*d^3 + 19*(A*B + B^2)*a^3*
b*d^4)*n)*x + 6*(18*(A^2 + 2*A*B + B^2)*a^3*b*c*d^3 + (55*B^2*b^4*d^4*n^2 +
 30*(A*B + B^2)*b^4*d^4*n + 18*(A^2 + 2*A*B + B^2)*b^4*d^4)*x^4 + (18*(A^2
+ 2*A*B + B^2)*b^4*c*d^3 + 54*(A^2 + 2*A*B + B^2)*a*b^3*d^4 + 5*(17*B^2*b^4
*c*d^3 + 27*B^2*a*b^3*d^4)*n^2 + 6*(11*(A*B + B^2)*b^4*c*d^3 + 9*(A*B + B^2
)*a*b^3*d^4)*n)*x^3 + (B^2*b^4*c^4 - 9*B^2*a*b^3*c^3*d + 54*B^2*a^2*b^2*c^2
*d^2 + 9*B^2*a^4*d^4)*n^2 + 3*(18*(A^2 + 2*A*B + B^2)*a*b^3*c*d^3 + 18*(A^2
 + 2*A*B + B^2)*a^2*b^2*d^4 + (11*B^2*b^4*c^2*d^2 + 63*B^2*a*b^3*c*d^3 + 36
*B^2*a^2*b^2*d^4)*n^2 + 6*((A*B + B^2)*b^4*c^2*d^2 + 9*(A*B + B^2)*a*b^3*c*
d^3)*n)*x^2 + 3*((A*B + B^2)*b^4*c^4 - 6*(A*B + B^2)*a*b^3*c^3*d + 18*(A*B
+ B^2)*a^2*b^2*c^2*d^2 - 3*(A*B + B^2)*a^4*d^4)*n + (54*(A^2 + 2*A*B + B^2)
*a^2*b^2*c*d^3 + 18*(A^2 + 2*A*B + B^2)*a^3*b*d^4 - (5*B^2*b^4*c^3*d - 81*B
^2*a*b^3*c^2*d^2 - 108*B^2*a^2*b^2*c*d^3 - 36*B^2*a^3*b*d^4)*n^2 - 6*((A*B
+ B^2)*b^4*c^3*d - 9*(A*B + B^2)*a*b^3*c^2*d^2 - 18*(A*B + B^2)*a^2*b^2*c*d
^3 + 6*(A*B + B^2)*a^3*b*d^4)*n)*x)*log((b*x + a)/(d*x + c)))/((b^8*c^5*d -
 5*a*b^7*c^4*d^2 + 10*a^2*b^6*c^3*d^3 - 10*a^3*b^5*c^2*d^4 + 5*a^4*b^4*c*d^
5 - a^5*b^3*d^6)*g^4*x^4 + (b^8*c^6 - 2*a*b^7*c^5*d - 5*a^2*b^6*c^4*d^2 + 2
0*a^3*b^5*c^3*d^3 - 25*a^4*b^4*c^2*d^4 + 14*a^5*b^3*c*d^5 - 3*a^6*b^2*d^6)*
g^4*x^3 + 3*(a*b^7*c^6 - 4*a^2*b^6*c^5*d + 5*a^3*b^5*c^4*d^2 - 5*a^5*b^3*c^
2*d^4 + 4*a^6*b^2*c*d^5 - a^7*b*d^6)*g^4*x^2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*
c^5*d + 25*a^4*b^4*c^4*d^2 - 20*a^5*b^3*c^3*d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7
*b*c*d^5 - a^8*d^6)*g^4*x + (a^3*b^5*c^6 - 5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4
*d^2 - 10*a^6*b^2*c^3*d^3 + 5*a^7*b*c^2*d^4 - a^8*c*d^5)*g^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**2
,x)
```

[Out] Timed out

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

[Out] Timed out

Mupad [B]
time = 11.67, size = 3157, normalized size = 4.33

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^4*(c*i + d*i*x)
^2),x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)*((x*(8*A*B*b^2*c*d - 8*A*B*a*b*d^2 + 12*B^2*
b*d*n*(a*d + b*c) + (16*B^2*a*b*d^2*n)/3 - (16*B^2*b^2*c*d*n)/3) - 6*A*B*a^
2*d^2 + 2*A*B*b^2*c^2 + 6*B^2*a^2*d^2*n + (2*B^2*b^2*c^2*n)/3 + 12*B^2*b^2*
d^2*n*x^2 + 4*A*B*a*b*c*d + (16*B^2*a*b*c*d*n)/3)/(x*(3*a^6*d^4*g^4*i^2 - 9
*a^2*b^4*c^4*g^4*i^2 + 24*a^3*b^3*c^3*d*g^4*i^2 - 18*a^4*b^2*c^2*d^2*g^4*i^
2) - x^2*(9*a*b^5*c^4*g^4*i^2 - 9*a^5*b*d^4*g^4*i^2 - 18*a^2*b^4*c^3*d*g^4*
i^2 + 18*a^4*b^2*c*d^3*g^4*i^2) - x^3*(3*b^6*c^4*g^4*i^2 - 9*a^4*b^2*d^4*g^
4*i^2 + 24*a^3*b^3*c*d^3*g^4*i^2 - 18*a^2*b^4*c^2*d^2*g^4*i^2) + x^4*(3*a^3
*b^3*d^4*g^4*i^2 - 3*b^6*c^3*d*g^4*i^2 + 9*a*b^5*c^2*d^2*g^4*i^2 - 9*a^2*b^
4*c*d^3*g^4*i^2) - 3*a^3*b^3*c^4*g^4*i^2 + 3*a^6*c*d^3*g^4*i^2 + 9*a^4*b^2*
c^3*d*g^4*i^2 - 9*a^5*b*c^2*d^2*g^4*i^2) - (4*d^3*(6*A*B*b + 5*B^2*b*n)*(x*
((a*d + b*c)*((3*a*g^4*i^2*n*(a*d - b*c)^4)/(2*d) + (3*g^4*i^2*n*(a*d - b*c
)^4*(2*a*d - b*c))/(2*d^2)) + (3*a*b*c*g^4*i^2*n*(a*d - b*c)^4)/d) + x^2*(b
*d*((3*a*g^4*i^2*n*(a*d - b*c)^4)/(2*d) + (3*g^4*i^2*n*(a*d - b*c)^4*(2*a*d
 - b*c))/(2*d^2)) + (3*b*g^4*i^2*n*(a*d + b*c)*(a*d - b*c)^4)/d) + a*c*((3*
a*g^4*i^2*n*(a*d - b*c)^4)/(2*d) + (3*g^4*i^2*n*(a*d - b*c)^4*(2*a*d - b*c)
)/(2*d^2)) + 3*b^2*g^4*i^2*n*x^3*(a*d - b*c)^4))/(3*g^4*i^2*n*(a*d - b*c)^3
*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(x*(3*a^6*d^4*g^4*i^2 - 9*a^2*b^4*c^4*g^4*
i^2 + 24*a^3*b^3*c^3*d*g^4*i^2 - 18*a^4*b^2*c^2*d^2*g^4*i^2) - x^2*(9*a*b^5
*c^4*g^4*i^2 - 9*a^5*b*d^4*g^4*i^2 - 18*a^2*b^4*c^3*d*g^4*i^2 + 18*a^4*b^2*
c*d^3*g^4*i^2) - x^3*(3*b^6*c^4*g^4*i^2 - 9*a^4*b^2*d^4*g^4*i^2 + 24*a^3*b^
3*c*d^3*g^4*i^2 - 18*a^2*b^4*c^2*d^2*g^4*i^2) + x^4*(3*a^3*b^3*d^4*g^4*i^2
- 3*b^6*c^3*d*g^4*i^2 + 9*a*b^5*c^2*d^2*g^4*i^2 - 9*a^2*b^4*c*d^3*g^4*i^2)
- 3*a^3*b^3*c^4*g^4*i^2 + 3*a^6*c*d^3*g^4*i^2 + 9*a^4*b^2*c^3*d*g^4*i^2 - 9
```

*a^5*b*c^2*d^2*g^4*i^2))) - ((27*A^2*a^3*d^3 + 9*A^2*b^3*c^3 + 54*B^2*a^3*d ^3*n^2 + 2*B^2*b^3*c^3*n^2 - 45*A^2*a*b^2*c^2*d + 117*A^2*a^2*b*c*d^2 - 54* A*B*a^3*d^3*n + 6*A*B*b^3*c^3*n - 25*B^2*a*b^2*c^2*d*n^2 + 299*B^2*a^2*b*c* d^2*n^2 - 48*A*B*a*b^2*c^2*d*n + 276*A*B*a^2*b*c*d^2*n)/(3*(a*d - b*c)) + (x^2*(90*A^2*a*b^2*d^3 + 18*A^2*b^3*c*d^2 + 245*B^2*a*b^2*d^3*n^2 + 85*B^2*b ^3*c*d^2*n^2 + 114*A*B*a*b^2*d^3*n + 66*A*B*b^3*c*d^2*n))/(a*d - b*c) + (2* x^3*(18*A^2*b^3*d^3 + 55*B^2*b^3*d^3*n^2 + 30*A*B*b^3*d^3*n))/(a*d - b*c) + (x*(198*A^2*a^2*b*d^3 - 18*A^2*b^3*c^2*d + 144*A^2*a*b^2*c*d^2 + 461*B^2*a ^2*b*d^3*n^2 - 19*B^2*b^3*c^2*d*n^2 + 548*B^2*a*b^2*c*d^2*n^2 + 114*A*B*a^2 *b*d^3*n - 30*A*B*b^3*c^2*d*n + 456*A*B*a*b^2*c*d^2*n))/(3*(a*d - b*c)))/(x *(9*a^6*d^4*g^4*i^2 - 27*a^2*b^4*c^4*g^4*i^2 + 72*a^3*b^3*c^3*d*g^4*i^2 - 5 4*a^4*b^2*c^2*d^2*g^4*i^2) - x^2*(27*a*b^5*c^4*g^4*i^2 - 27*a^5*b*d^4*g^4*i ^2 - 54*a^2*b^4*c^3*d*g^4*i^2 + 54*a^4*b^2*c*d^3*g^4*i^2) - x^3*(9*b^6*c^4* g^4*i^2 - 27*a^4*b^2*d^4*g^4*i^2 + 72*a^3*b^3*c*d^3*g^4*i^2 - 54*a^2*b^4*c^ 2*d^2*g^4*i^2) + x^4*(9*a^3*b^3*d^4*g^4*i^2 - 9*b^6*c^3*d*g^4*i^2 + 27*a*b^ 5*c^2*d^2*g^4*i^2 - 27*a^2*b^4*c*d^3*g^4*i^2) - 9*a^3*b^3*c^4*g^4*i^2 + 9*a ^6*c*d^3*g^4*i^2 + 27*a^4*b^2*c^3*d*g^4*i^2 - 27*a^5*b*c^2*d^2*g^4*i^2) - l og(e*((a + b*x)/(c + d*x))^n)^2*(((B^2*(3*a*d + b*c))/(3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (4*B^2*b*d*x)/(3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)))/(x^3*(b ^3*c*g^4*i^2 + 3*a*b^2*d*g^4*i^2) + x^2*(3*a*b^2*c*g^4*i^2 + 3*a^2*b*d*g^4* i^2) + x*(a^3*d*g^4*i^2 + 3*a^2*b*c*g^4*i^2) + a^3*c*g^4*i^2 + b^3*d*g^4*i^ 2*x^4) - (2*d^3*(6*A*B*b + 5*B^2*b*n))/(3*g^4*i^2*n*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (4*B^2*b*d^3*(x*((a*d + b*c)*((a*g^4*i^2*n*(a*d - b*c))/(2*d) + (g^4*i^2*n*(a*d - b*c)*(2*a*d - b*c))/(2*d^2)) + (a*b*c*g^4* i^2*n*(a*d - b*c))/d) + x^2*(b*d*((a*g^4*i^2*n*(a*d - b*c))/(2*d) + (g^4*i^ 2*n*(a*d - b*c)*(2*a*d - b*c))/(2*d^2)) + (b*g^4*i^2*n*(a*d + b*c)*(a*d - b *c))/d) + a*c*((a*g^4*i^2*n*(a*d - b*c))/(2*d) + (g^4*i^2*n*(a*d - b*c)*(2* a*d - b*c))/(2*d^2)) + b^2*g^4*i^2*n*x^3*(a*d - b*c)))/(g^4*i^2*n*(a*d - b* c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(x^3*(b^3*c*g^4*i^2 + 3*a*b^2*d*g^4*i^ 2) + x^2*(3*a*b^2*c*g^4*i^2 + 3*a^2*b*d*g^4*i^2) + x*(a^3*d*g^4*i^2 + 3*a^2 *b*c*g^4*i^2) + a^3*c*g^4*i^2 + b^3*d*g^4*i^2*x^4))) - (b*d^3*atan((b*d^3*(18*A^2 + 55*B^2*n^2 + 30*A*B*n)*(9*a^5*d^5*g^4*i^2 + 9*b^5*c^5*g^4*i^2 - 27 *a*b^4*c^4*d*g^4*i^2 - 27*a^4*b*c*d^4*g^4*i^2 + 18*a^2*b^3*c^3*d^2*g^4*i^2 + 18*a^3*b^2*c^2*d^3*g^4*i^2)*2i)/(9*g^4*i^2*(a*d - b*c)^5*(36*A^2*b*d^3 + 110*B^2*b*d^3*n^2 + 60*A*B*b*d^3*n)) + (b^2*d^4*x*(18*A^2 + 55*B^2*n^2 + 30 *A*B*n)*(a^4*d^4*g^4*i^2 + b^4*c^4*g^4*i^2 - 4*a*b^3*c^3*d*g^4*i^2 - 4*a^3* b*c*d^3*g^4*i^2 + 6*a^2*b^2*c^2*d^2*g^4*i^2)*4i)/(g^4*i^2*(a*d - b*c)^5*(36 *A^2*b*d^3 + 110*B^2*b*d^3*n^2 + 60*A*B*b*d^3*n)))*(18*A^2 + 55*B^2*n^2 + 3 0*A*B*n)*4i)/(9*g^4*i^2*(a*d - b*c)^5) + (4*B^2*b*d^3*log(e*((a + b*x)/(c + d*x))^n)^3)/(3*g^4*i^2*n*(a*d - b*c)^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))

3.202 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=676

$$\frac{B^2(bc-ad)g^3n^2(a+bx)^2}{4d^2i^3(c+dx)^2}-\frac{4AbB(bc-ad)g^3n(a+bx)}{d^3i^3(c+dx)}+\frac{4bB^2(bc-ad)g^3n^2(a+bx)}{d^3i^3(c+dx)}-\frac{4bB^2(bc-ad)g^3n(a}{d^3i^3(c}$$

```
[Out] 1/4*B^2*(-a*d+b*c)*g^3*n^2*(b*x+a)^2/d^2/i^3/(d*x+c)^2-4*A*b*B*(-a*d+b*c)*g
^3*n*(b*x+a)/d^3/i^3/(d*x+c)+4*b*B^2*(-a*d+b*c)*g^3*n^2*(b*x+a)/d^3/i^3/(d*
x+c)-4*b*B^2*(-a*d+b*c)*g^3*n*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/d^3/i^3/(d*
x+c)-1/2*B*(-a*d+b*c)*g^3*n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/d^2/i
^3/(d*x+c)^2+b^2*g^3*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^3/i^3+1/2*
(-a*d+b*c)*g^3*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^2/i^3/(d*x+c)^
2+2*b*(-a*d+b*c)*g^3*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^3/i^3/(d*x
+c)+2*b^2*B*(-a*d+b*c)*g^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/
b/(d*x+c))/d^4/i^3+3*b^2*(-a*d+b*c)*g^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*l
n((-a*d+b*c)/b/(d*x+c))/d^4/i^3+2*b^2*B^2*(-a*d+b*c)*g^3*n^2*polylog(2,d*(b
*x+a)/b/(d*x+c))/d^4/i^3+6*b^2*B*(-a*d+b*c)*g^3*n*(A+B*ln(e*((b*x+a)/(d*x+c
))^n))*polylog(2,d*(b*x+a)/b/(d*x+c))/d^4/i^3-6*b^2*B^2*(-a*d+b*c)*g^3*n^2*
polylog(3,d*(b*x+a)/b/(d*x+c))/d^4/i^3
```

Rubi [A]

time = 0.41, antiderivative size = 676, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.244$, Rules used = {2561, 2395, 2333, 2332, 2342, 2341, 2355, 2354, 2438, 2421, 6724}

$$\frac{6b^2Bg^3n(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^4i^3}+\frac{2b^2B^2g^3n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3}-\frac{6b^2B^2g^3n^2(bc-ad)\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3}+\frac{3b^2g^3(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^4i^3}+\frac{2b^2Bg^3n(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^4i^3}+\frac{b^2g^3(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^3i^3}+\frac{2bg^3(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^3i^3(c+dx)}-\frac{4AbBg^3n(a+bx)(bc-ad)}{d^3i^3(c+dx)}+\frac{g^3(a+bx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2d^2i^3(c+dx)^2}-\frac{Bg^3n(a+bx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d^2i^3(c+dx)^2}-\frac{4bB^2g^3n(a+bx)(bc-ad)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^3i^3(c+dx)}+\frac{4bB^2g^3n^2(a+bx)(bc-ad)}{d^3i^3(c+dx)}+\frac{B^2g^3n^2(a+bx)^2(bc-ad)}{4d^2i^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^3,x]
```

```
[Out] (B^2*(b*c - a*d)*g^3*n^2*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (4*A*b*B*(b
*c - a*d)*g^3*n*(a + b*x))/(d^3*i^3*(c + d*x)) + (4*b*B^2*(b*c - a*d)*g^3*n
^2*(a + b*x))/(d^3*i^3*(c + d*x)) - (4*b*B^2*(b*c - a*d)*g^3*n*(a + b*x)*Lo
g[e*((a + b*x)/(c + d*x))^n])/(d^3*i^3*(c + d*x)) - (B*(b*c - a*d)*g^3*n*(a
 + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*i^3*(c + d*x)^2) +
 (b^2*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3*i^3) + (
(b*c - a*d)*g^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d^
2*i^3*(c + d*x)^2) + (2*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2)/(d^3*i^3*(c + d*x)) + (2*b^2*B*(b*c - a*d)*g^3*n*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i^3) +
 (3*b^2*(b*c - a*d)*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c -
```

```
a*d)/(b*(c + d*x))])/(d^4*i^3) + (2*b^2*B^2*(b*c - a*d)*g^3*n^2*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3) + (6*b^2*B*(b*c - a*d)*g^3*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/
(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*n^2*PolyLog[3, (d*(a + b*x))/(b*(c +
 d*x))])/(d^4*i^3)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2355

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[x*((a + b*Log[c*x^n])^p/(d*(d + e*x))), x] - Dist[b*n*(p/d),
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
```

```
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(202c+202dx)^3}\,dx = \int \left(\frac{b^3g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8242408d^3} + \frac{(-bc+ad)^3g^3\left(A+B\log\right.}{8242408d^3(c+}\right.$$

$$= \frac{(b^3g^3)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx}{8242408d^3} - \frac{(3b^2(bc-ad)g^3)\int \frac{(A+}{}}{824240}$$

$$= \frac{b^3g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8242408d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{16484816d^4(c+dx)^2}$$

$$= \frac{b^3g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8242408d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{16484816d^4(c+dx)^2}$$

$$= \frac{b^3g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8242408d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{16484816d^4(c+dx)^2}$$

$$= \frac{b^3g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8242408d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{16484816d^4(c+dx)^2}$$

$$= -\frac{B(bc-ad)^3g^3n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16484816d^4(c+dx)^2} + \frac{5bB(bc-ad)^2g^3n}{824240}$$

$$= -\frac{B(bc-ad)^3g^3n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16484816d^4(c+dx)^2} + \frac{5bB(bc-ad)^2g^3n}{824240}$$

$$= -\frac{B(bc-ad)^3g^3n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16484816d^4(c+dx)^2} + \frac{5bB(bc-ad)^2g^3n}{824240}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad}{1648}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad}{1648}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad}{1648}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad}{1648}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad}{1648}$$

$$\frac{B^2(bc-ad)^3g^3n^2}{} \quad \frac{9bB^2(bc-ad)^2g^3n^2}{} \quad \frac{9b^2B^2(bc-ad}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 4669 vs. $2(676) = 1352$.
time = 7.62, size = 4669, normalized size = 6.91

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x)^3,x]
```

```
[Out] (g^3*(4*b^3*d*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(
c + d*x)])^2 + (2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n
*Log[(a + b*x)/(c + d*x)])^2)/(c + d*x)^2 - (12*b*(b*c - a*d)^2*(A + B*Log[
e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2)/(c + d*x) - 1
2*b^2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)
/(c + d*x)])^2*Log[c + d*x] + (6*a^2*b*B*d^2*n*(-A - B*Log[e*((a + b*x)/(c
+ d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(-(b^2*c^3) + 4*a*b*c^2*d - 3*a^
2*c*d^2 - 2*b^2*c^2*d*x + 6*a*b*c*d^2*x - 4*a^2*d^3*x - 2*b*(b*c - 2*a*d)*(
c + d*x)^2*Log[a + b*x] + 2*(b*c - a*d)^2*(c + 2*d*x)*Log[(a + b*x)/(c + d*
x)] + 2*b^2*c^3*Log[c + d*x] - 4*a*b*c^2*d*Log[c + d*x] + 4*b^2*c^2*d*x*Log
[c + d*x] - 8*a*b*c*d^2*x*Log[c + d*x] + 2*b^2*c*d^2*x^2*Log[c + d*x] - 4*a
*b*d^3*x^2*Log[c + d*x]))/((b*c - a*d)^2*(c + d*x)^2) + (2*a^3*B*d^3*n*(-A
- B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(-(b^2*c
^2) + 4*a*b*c*d - a^2*d^2 + 2*b^2*c*d*x + 2*a*b*d^2*x + 2*b^2*d^2*x^2 - 2*b
^2*(c + d*x)^2*Log[a/b + x] + 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)] + 2*
b^2*c^2*Log[(b*(c + d*x))/(b*c - a*d)] + 4*b^2*c*d*x*Log[(b*(c + d*x))/(b*c
 - a*d)] + 2*b^2*d^2*x^2*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^2*(c
 + d*x)^2) + 6*a*b^2*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[
(a + b*x)/(c + d*x)])*(-2*Log[c/d + x]^2 - (8*c*(1 + Log[c/d + x]))/(c + d*
x) + (c^2*(1 + 2*Log[c/d + x]))/(c + d*x)^2 + 8*c*(Log[a/b + x]/(c + d*x) +
 (b*(Log[a + b*x] - Log[c + d*x]))/(-(b*c) + a*d)) + 2*(-Log[a/b + x] + Log
[c/d + x] + Log[(a + b*x)/(c + d*x)])*((c*(3*c + 4*d*x))/(c + d*x)^2 + 2*Lo
g[c + d*x]) + (2*c^2*(-Log[a/b + x] + (b*(c + d*x)*(b*c - a*d + b*(c + d*x)
*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]))/(b*c - a*d)^2))/(c + d*x)^2 + 4*
(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(
b*c) + a*d)])) - 2*b^3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[
(a + b*x)/(c + d*x)])*(-4*d*(a/b + x)*(-1 + Log[a/b + x]) + 4*(c + d*x)*(-1
 + Log[c/d + x]) - 6*c*Log[c/d + x]^2 - (12*c^2*(1 + Log[c/d + x]))/(c + d*
x) + (c^3*(1 + 2*Log[c/d + x]))/(c + d*x)^2 - 12*c^2*(-(Log[a/b + x]/(c + d
*x)) + (b*(Log[a + b*x] - Log[c + d*x]))/(b*c - a*d)) + 2*(-Log[a/b + x] +
Log[c/d + x] + Log[(a + b*x)/(c + d*x)])*(-2*d*x + (c^2*(5*c + 6*d*x))/(c +
 d*x)^2 + 6*c*Log[c + d*x]) + (2*c^3*(-Log[a/b + x] + (b*(c + d*x)*(b*c - a
*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]))/(b*c - a*d)^2))/
(c + d*x)^2 + 12*c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2
, (d*(a + b*x))/(-(b*c) + a*d)])) + (3*a^2*b*B^2*d^2*n^2*(2*c*Log[(a + b*x)
```

```
/(c + d*x)]^2 - 4*(c + d*x)*Log[(a + b*x)/(c + d*x)]^2 - (4*(c + d*x)*(2*b*
c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d
*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*
Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c
+ b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(
b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(L
og[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b
*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c
 - a*d) + (c*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2
*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)] - 4*b*(b*c - a*d)*
(c + d*x)*Log[(a + b*x)/(c + d*x)] - 4*b^2*(c + d*x)^2*Log[a + b*x]*Log[(a
+ b*x)/(c + d*x)] - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4*b*(c + d*x)*(b*c - a
*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - 4*b^2*(c + d*x)
^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*b^2*(c + d*x
)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Pol
yLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c + d*x)^2*(Log[(b*c - a*d)
/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c
 + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2))/(c
 + d*x)^2 - (a^3*B^2*d^3*n^2*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2
*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)] -
4*b*(b*c - a*d)*(c + d*x)*Log[(a + b*x)/(c + d*x)] - 4*b^2*(c + d*x)^2*Log[
a + b*x]*Log[(a + b*x)/(c + d*x)] + 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)
]^2 - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4*b*(c + d*x)*(b*c - a*d + b*(c + d*
x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - 4*b^2*(c + d*x)^2*Log[(a + b*
x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*b^2*(c + d*x)^2*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) + 2*b^2*(c + d*x)^2*(Log[(b*c - a*d)/(b*c + b*d*x)
]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) -
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)^2*(c + d*x)^2) + 2*
b^3*B^2*n^2*((2*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2)/b + (c^3*Log[(a + b
*x)/(c + d*x)]^2)/(c + d*x)^2 - (6*c^2*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x
) + 6*c*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a...
```

Maple [**F**]

time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

Maxima [**F**]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="maxima")
```

```
[Out] -2*(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*lo
g(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c
 - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*
b*c^2*d^2 - I*a*c*d^3)*x))*A*B*a^3*g^3*n - 6*A*B*a^2*b*g^3*n*((b^2*c - 2*a*
b*d)*log(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c
- 2*a*b*d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (
b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a*c^2*d^3 -
4*(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) + A^2*b^3*g^3
*((6*c^2*d*x + 5*c^3)/(2*I*d^6*x^2 + 4*I*c*d^5*x + 2*I*c^2*d^4) + I*x/d^3 -
 3*I*c*log(d*x + c)/d^4) - 3*A^2*a*b^2*g^3*((4*c*d*x + 3*c^2)/(2*I*d^5*x^2
+ 4*I*c*d^4*x + 2*I*c^2*d^3) - I*log(d*x + c)/d^3) + 6*(2*d*x + c)*A*B*a^2*
b*g^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2
*I*c^2*d^2) + 3*(2*d*x + c)*A^2*a^2*b*g^3/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*
c^2*d^2) + 2*A*B*a^3*g^3*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(2*I*d^3*x^
2 + 4*I*c*d^2*x + 2*I*c^2*d) + A^2*a^3*g^3/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I
*c^2*d) + 1/2*(2*I*B^2*b^3*d^3*g^3*x^3 + 4*I*B^2*b^3*c*d^2*g^3*x^2 - 2*(2*I
*b^3*c^2*d*g^3 - 6*I*a*b^2*c*d^2*g^3 + 3*I*a^2*b*d^3*g^3)*B^2*x + (-5*I*b^3
*c^3*g^3 + 9*I*a*b^2*c^2*d*g^3 - 3*I*a^2*b*c*d^2*g^3 - I*a^3*d^3*g^3)*B^2 -
 6*((I*b^3*c*d^2*g^3 - I*a*b^2*d^3*g^3)*B^2*x^2 + 2*(I*b^3*c^2*d*g^3 - I*a*
b^2*c*d^2*g^3)*B^2*x + (I*b^3*c^3*g^3 - I*a*b^2*c^2*d*g^3)*B^2)*log(d*x + c
))*log((d*x + c)^n)^2/(d^6*x^2 + 2*c*d^5*x + c^2*d^4) - integrate((-3*I*B^2
*a^2*b*d^3*g^3*x - I*B^2*a^3*d^3*g^3 + (-2*I*A*B*b^3*d^3*g^3 - I*B^2*b^3*d^
3*g^3)*x^3 - 3*(2*I*A*B*a*b^2*d^3*g^3 + I*B^2*a*b^2*d^3*g^3)*x^2 + (-I*B^2*
b^3*d^3*g^3*x^3 - 3*I*B^2*a*b^2*d^3*g^3*x^2 - 3*I*B^2*a^2*b*d^3*g^3*x - I*B
^2*a^3*d^3*g^3)*log((b*x + a)^n)^2 - 2*(3*I*B^2*a^2*b*d^3*g^3*x + I*B^2*a^3
*d^3*g^3 + (I*A*B*b^3*d^3*g^3 + I*B^2*b^3*d^3*g^3)*x^3 + 3*(I*A*B*a*b^2*d^3
*g^3 + I*B^2*a*b^2*d^3*g^3)*x^2)*log((b*x + a)^n) - (2*(2*I*b^3*c^2*d*g^3*n
 - 6*I*a*b^2*c*d^2*g^3*n + 3*a^2*b*d^3*g^3*(I*n - I))*B^2*x + 2*(B^2*b^3*d^
3*g^3*(-I*n - I) - I*A*B*b^3*d^3*g^3)*x^3 - (-5*I*b^3*c^3*g^3*n + 9*I*a*b^2
*c^2*d*g^3*n - 3*I*a^2*b*c*d^2*g^3*n + a^3*d^3*g^3*(-I*n + 2*I))*B^2 + 2*(-
3*I*A*B*a*b^2*d^3*g^3 + (-2*I*b^3*c*d^2*g^3*n - 3*I*a*b^2*d^3*g^3)*B^2)*x^2
 + 6*((I*b^3*c*d^2*g^3*n - I*a*b^2*d^3*g^3*n)*B^2*x^2 + 2*(I*b^3*c^2*d*g^3*
n - I*a*b^2*c*d^2*g^3*n)*B^2*x + (I*b^3*c^3*g^3*n - I*a*b^2*c^2*d*g^3*n)*B^
2)*log(d*x + c) + 2*(-I*B^2*b^3*d^3*g^3*x^3 - 3*I*B^2*a*b^2*d^3*g^3*x^2 - 3
*I*B^2*a^2*b*d^3*g^3*x - I*B^2*a^3*d^3*g^3)*log((b*x + a)^n))*log((d*x + c)
^n))/(d^6*x^3 + 3*c*d^5*x^2 + 3*c^2*d^4*x + c^3*d^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] integral(((I*A^2 + 2*I*A*B + I*B^2)*b^3*g^3*x^3 - 3*(-I*A^2 - 2*I*A*B - I*B
^2)*a*b^2*g^3*x^2 - 3*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b*g^3*x + (I*A^2 + 2*I
*A*B + I*B^2)*a^3*g^3 + (I*B^2*b^3*g^3*n^2*x^3 + 3*I*B^2*a*b^2*g^3*n^2*x^2
+ 3*I*B^2*a^2*b*g^3*n^2*x + I*B^2*a^3*g^3*n^2)*log((b*x + a)/(d*x + c))^2 -
 2*((-I*A*B - I*B^2)*b^3*g^3*n*x^3 + 3*(-I*A*B - I*B^2)*a*b^2*g^3*n*x^2 + 3
*(-I*A*B - I*B^2)*a^2*b*g^3*n*x + (-I*A*B - I*B^2)*a^3*g^3*n)*log((b*x + a)
/(d*x + c)))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

Giac [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{{\left(c\,i+d\,i\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^3,x)
```

```
[Out] int(((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^3, x)
```

3.203 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=441

$$-\frac{B^2g^2n^2(a+bx)^2}{4di^3(c+dx)^2}+\frac{2AbBg^2n(a+bx)}{d^2i^3(c+dx)}-\frac{2bB^2g^2n^2(a+bx)}{d^2i^3(c+dx)}+\frac{2bB^2g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^2i^3(c+dx)}+\frac{Bg^2n(a+bx)}{2}$$

```
[Out] -1/4*B^2*g^2*n^2*(b*x+a)^2/d/i^3/(d*x+c)^2+2*A*b*B*g^2*n*(b*x+a)/d^2/i^3/(d
*x+c)-2*b*B^2*g^2*n^2*(b*x+a)/d^2/i^3/(d*x+c)+2*b*B^2*g^2*n*(b*x+a)*ln(e*((
b*x+a)/(d*x+c))^n)/d^2/i^3/(d*x+c)+1/2*B*g^2*n*(b*x+a)^2*(A+B*ln(e*((b*x+a)
/(d*x+c))^n))/d/i^3/(d*x+c)^2-1/2*g^2*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))
^n))^2/d/i^3/(d*x+c)^2-b*g^2*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d^2/
i^3/(d*x+c)-b^2*g^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln((-a*d+b*c)/b/(d*x+
c))/d^3/i^3-2*b^2*B*g^2*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,d*(b*x+
a)/b/(d*x+c))/d^3/i^3+2*b^2*B^2*g^2*n^2*polylog(3,d*(b*x+a)/b/(d*x+c))/d^3/
i^3
```

Rubi [A]
time = 0.29, antiderivative size = 441, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2561, 2395, 2333, 2332, 2342, 2341, 2354, 2421, 6724}

$$-\frac{2b^2Bg^2n\,\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^3}+\frac{2b^2B^2g^2n^2\,\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^3}-\frac{b^2g^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^3i^3}-\frac{bg^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{d^2i^3(c+dx)}+\frac{2AbBg^2n(a+bx)}{d^2i^3(c+dx)}-\frac{g^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2di^3(c+dx)^2}+\frac{Bg^2n(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2di^3(c+dx)^2}+\frac{2bB^2g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{d^2i^3(c+dx)}-\frac{2bB^2g^2n^2(a+bx)}{d^2i^3(c+dx)}-\frac{B^2g^2n^2(a+bx)^2}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^3,x]
```

```
[Out] -1/4*(B^2*g^2*n^2*(a + b*x)^2)/(d*i^3*(c + d*x)^2) + (2*A*b*B*g^2*n*(a + b*
x))/(d^2*i^3*(c + d*x)) - (2*b*B^2*g^2*n^2*(a + b*x))/(d^2*i^3*(c + d*x)) +
 (2*b*B^2*g^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i^3*(c + d*x
)) + (B*g^2*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i^3*
(c + d*x)^2) - (g^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(
2*d*i^3*(c + d*x)^2) - (b*g^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2)/(d^2*i^3*(c + d*x)) - (b^2*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^3) - (2*b^2*B*g^2*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^
3) + (2*b^2*B^2*g^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2354

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^p/e), x] - Dist[b*n*(p/e),
 Int[Log[1 + e*(x/d)]*((a + b*Log[c*x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
```

```
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(203c+203dx)^3}\,dx = \int \left(\frac{(-bc+ad)^2 g^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8365427d^2(c+dx)^3} - \frac{2b(bc-ad)g^2}{8365\ldots}\right.$$

$$= \frac{(b^2g^2)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{8365427d^2} - \frac{(2b(bc-ad)g^2)\int \frac{\left(A+B\log\left(\ldots\right.\right.}{(c\ldots}}{8365427d^2}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16730854d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+\ldots\right.}{8365427d\ldots}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16730854d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+\ldots\right.}{8365427d\ldots}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16730854d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+\ldots\right.}{8365427d\ldots}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16730854d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+\ldots\right.}{8365427d\ldots}$$

$$= \frac{B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16730854d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n(\ldots}{836542\ldots}$$

$$= \frac{B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16730854d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n(\ldots}{836542\ldots}$$

$$= \frac{B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16730854d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n(\ldots}{836542\ldots}$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\,\mathrm{l}\ldots}{167308\ldots}$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\,\mathrm{l}\ldots}{167308\ldots}$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\,\mathrm{l}\ldots}{167308\ldots}$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\,\mathrm{l}\ldots}{167308\ldots}$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\,\mathrm{l}\ldots}{167308\ldots}$$

$$B^2(bc-ad)^2g^2n^2 \quad 5bB^2(bc-ad)g^2n^2 \quad 5b^2B^2g^2n^2\,\mathrm{l}\ldots$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 3172 vs. $2(441) = 882$.
time = 3.89, size = 3172, normalized size = 7.19

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x)^3,x]
```

```
[Out] (g^2*((-2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a
+ b*x)/(c + d*x)])^2)/(c + d*x)^2 + (8*b*(b*c - a*d)*(A + B*Log[e*((a + b*x
)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2)/(c + d*x) + 4*b^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*Log[c + d
*x] + (4*a*b*B*d*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a + b*
x)/(c + d*x)])*(-(b^2*c^3) + 4*a*b*c^2*d - 3*a^2*c*d^2 - 2*b^2*c^2*d*x + 6*
a*b*c*d^2*x - 4*a^2*d^3*x - 2*b*(b*c - 2*a*d)*(c + d*x)^2*Log[a + b*x] + 2*
(b*c - a*d)^2*(c + 2*d*x)*Log[(a + b*x)/(c + d*x)] + 2*b^2*c^3*Log[c + d*x]
 - 4*a*b*c^2*d*Log[c + d*x] + 4*b^2*c^2*d*x*Log[c + d*x] - 8*a*b*c*d^2*x*Lo
g[c + d*x] + 2*b^2*c*d^2*x^2*Log[c + d*x] - 4*a*b*d^3*x^2*Log[c + d*x]))/((
b*c - a*d)^2*(c + d*x)^2) + (2*a^2*B*d^2*n*(-A - B*Log[e*((a + b*x)/(c + d*
x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(-(b^2*c^2) + 4*a*b*c*d - a^2*d^2 +
2*b^2*c*d*x + 2*a*b*d^2*x + 2*b^2*d^2*x^2 - 2*b^2*(c + d*x)^2*Log[a/b + x]
+ 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)] + 2*b^2*c^2*Log[(b*(c + d*x))/(b
*c - a*d)] + 4*b^2*c*d*x*Log[(b*(c + d*x))/(b*c - a*d)] + 2*b^2*d^2*x^2*Log
[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^2*(c + d*x)^2) + 2*b^2*B*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*Log[c/
d + x]^2 - (8*c*(1 + Log[c/d + x]))/(c + d*x) + (c^2*(1 + 2*Log[c/d + x]))/
(c + d*x)^2 + 8*c*(Log[a/b + x]/(c + d*x) + (b*(Log[a + b*x] - Log[c + d*x]
))/(-(b*c) + a*d)) + 2*(-Log[a/b + x] + Log[c/d + x] + Log[(a + b*x)/(c + d
*x)])*((c*(3*c + 4*d*x))/(c + d*x)^2 + 2*Log[c + d*x]) + (2*c^2*(-Log[a/b +
 x] + (b*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[
c + d*x]))/(b*c - a*d)^2))/(c + d*x)^2 + 4*(Log[a/b + x]*Log[(b*(c + d*x))/
(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) + (2*a*b*B^2*d*n^
2*(2*c*Log[(a + b*x)/(c + d*x)]^2 - 4*(c + d*x)*Log[(a + b*x)/(c + d*x)]^2
- (4*(c + d*x)*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*
Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*
x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*L
og[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2
*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d
)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b
*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])))/(b*c - a*d) + (c*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x)
 + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)
] - 4*b*(b*c - a*d)*(c + d*x)*Log[(a + b*x)/(c + d*x)] - 4*b^2*(c + d*x)^2*
```

```
Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4*
b*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x
]) - 4*b^2*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*
x)] + 2*b^2*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(
b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c + d*x
)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] +
Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
)/(b*c - a*d)^2))/(c + d*x)^2 - (a^2*B^2*d^2*n^2*((b*c - a*d)^2 + 2*b*(b*c
- a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(a
+ b*x)/(c + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*Log[(a + b*x)/(c + d*x)] - 4*
b^2*(c + d*x)^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + 2*(b*c - a*d)^2*Log
[(a + b*x)/(c + d*x)]^2 - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4*b*(c + d*x)*(b
*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - 4*b^2*(c
+ d*x)^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*b^2*(c
 + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) -
 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c + d*x)^2*(Log[(b*c
- a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d
)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)
^2*(c + d*x)^2) - 2*b^2*B^2*n^2*((c^2*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x)
^2 - (4*c*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x) + 2*Log[(a + b*x)/(c + d*x)
]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 4*Log[(a + b*x)/(c + d*x)]*PolyLog[2,
(d*(a + b*x))/(b*(c + d*x))] - (4*c*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a +
b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*
Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(
a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*L
og[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x)) + (c^2*((b*c -
 a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b
*c - a*d)^2*Log[(a + b*x)/(c + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*Log[(a + b
*x)/(c + d*x)] - 4*b^2*(c + d*x)^2*Log[a + b*x]...
```

Maple [F]

time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

Maple [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="maxima")
```

```
[Out] -2*(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*lo
g(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c
 - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*
b*c^2*d^2 - I*a*c*d^3)*x))*A*B*a^2*g^2*n - 4*A*B*a*b*g^2*n*((b^2*c - 2*a*b*
d)*log(b*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c -
2*a*b*d)*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b*
c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a*c^2*d^3 - 4*
(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) - A^2*b^2*g^2*(
(4*c*d*x + 3*c^2)/(2*I*d^5*x^2 + 4*I*c*d^4*x + 2*I*c^2*d^3) - I*log(d*x + c
)/d^3) + 4*(2*d*x + c)*A*B*a*b*g^2*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(
2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + 2*(2*d*x + c)*A^2*a*b*g^2/(2*I*d
^4*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + 2*A*B*a^2*g^2*log((b*x/(d*x + c) + a/
(d*x + c))^n*e)/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + A^2*a^2*g^2/(2*I*
d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) - 1/2*(4*(-I*b^2*c*d*g^2 + I*a*b*d^2*g^2
)*B^2*x - (3*I*b^2*c^2*g^2 - 2*I*a*b*c*d*g^2 - I*a^2*d^2*g^2)*B^2 + 2*(-I*B
^2*b^2*d^2*g^2*x^2 - 2*I*B^2*b^2*c*d*g^2*x - I*B^2*b^2*c^2*g^2)*log(d*x + c
))*log((d*x + c)^n)^2/(d^5*x^2 + 2*c*d^4*x + c^2*d^3) - integrate((-2*I*B^2
*a*b*d^2*g^2*x - I*B^2*a^2*d^2*g^2 + (-2*I*A*B*b^2*d^2*g^2 - I*B^2*b^2*d^2*
g^2)*x^2 + (-I*B^2*b^2*d^2*g^2*x^2 - 2*I*B^2*a*b*d^2*g^2*x - I*B^2*a^2*d^2*
g^2)*log((b*x + a)^n)^2 - 2*(2*I*B^2*a*b*d^2*g^2*x + I*B^2*a^2*d^2*g^2 + (I
*A*B*b^2*d^2*g^2 + I*B^2*b^2*d^2*g^2)*x^2)*log((b*x + a)^n) - (4*(-I*b^2*c*
d*g^2*n + a*b*d^2*g^2*(I*n - I))*B^2*x - (3*I*b^2*c^2*g^2*n - 2*I*a*b*c*d*g
^2*n + a^2*d^2*g^2*(-I*n + 2*I))*B^2 + 2*(-I*A*B*b^2*d^2*g^2 - I*B^2*b^2*d^
2*g^2)*x^2 + 2*(-I*B^2*b^2*d^2*g^2*n*x^2 - 2*I*B^2*b^2*c*d*g^2*n*x - I*B^2*
b^2*c^2*g^2*n)*log(d*x + c) + 2*(-I*B^2*b^2*d^2*g^2*x^2 - 2*I*B^2*a*b*d^2*g
^2*x - I*B^2*a^2*d^2*g^2)*log((b*x + a)^n))*log((d*x + c)^n))/(d^5*x^3 + 3*
c*d^4*x^2 + 3*c^2*d^3*x + c^3*d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] integral(((I*A^2 + 2*I*A*B + I*B^2)*b^2*g^2*x^2 - 2*(-I*A^2 - 2*I*A*B - I*B
^2)*a*b*g^2*x + (I*A^2 + 2*I*A*B + I*B^2)*a^2*g^2 + (I*B^2*b^2*g^2*n^2*x^2
+ 2*I*B^2*a*b*g^2*n^2*x + I*B^2*a^2*g^2*n^2)*log((b*x + a)/(d*x + c))^2 - 2
*((-I*A*B - I*B^2)*b^2*g^2*n*x^2 + 2*(-I*A*B - I*B^2)*a*b*g^2*n*x + (-I*A*B
 - I*B^2)*a^2*g^2*n)*log((b*x + a)/(d*x + c)))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c
^2*d*x + c^3), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g^2\left(\int \frac{A^2a^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{A^2b^2x^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{B^2a^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{2ABa^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{2A^2abx}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{B^2b^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{2ABb^2x^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{2B^2abx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{4ABabx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx\right)}{i^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3
,x)
```

```
[Out] g**2*(Integral(A**2*a**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x
) + Integral(A**2*b**2*x**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3)
, x) + Integral(B**2*a**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c**3
+ 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integral(2*A*B*a**2*log(e*(
a/(c + d*x) + b*x/(c + d*x))**n)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*
x**3), x) + Integral(2*A**2*a*b*x/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3
*x**3), x) + Integral(B**2*b**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n
)**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integral(2*A*B*b
**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**3 + 3*c**2*d*x + 3*c*d
**2*x**2 + d**3*x**3), x) + Integral(2*B**2*a*b*x*log(e*(a/(c + d*x) + b*x/
(c + d*x))**n)**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Int
egral(4*A*B*a*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**3 + 3*c**2*d*
x + 3*c*d**2*x**2 + d**3*x**3), x))/i**3
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/(I*d*x +
 I*c)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{{\left(c\,i+d\,i\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^3,x)
```

```
[Out] int(((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^3, x)
```

3.204 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=151

$$\frac{B^2gn^2(a+bx)^2}{4(bc-ad)i^3(c+dx)^2}-\frac{Bgn(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2(bc-ad)i^3(c+dx)^2}+\frac{g(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2(bc-ad)i^3(c+dx)^2}$$

```
[Out] 1/4*B^2*g*n^2*(b*x+a)^2/(-a*d+b*c)/i^3/(d*x+c)^2-1/2*B*g*n*(b*x+a)^2*(A+B*l
n(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)/i^3/(d*x+c)^2+1/2*g*(b*x+a)^2*(A+B*ln(
e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)/i^3/(d*x+c)^2
```

Rubi [A]
time = 0.08, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.070$, Rules used = {2561, 2342, 2341}

$$\frac{g(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2i^3(c+dx)^2(bc-ad)}-\frac{Bgn(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2i^3(c+dx)^2(bc-ad)}+\frac{B^2gn^2(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x)^
3,x]
```

```
[Out] (B^2*g*n^2*(a + b*x)^2)/(4*(b*c - a*d)*i^3*(c + d*x)^2) - (B*g*n*(a + b*x)^
2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*i^3*(c + d*x)^2) +
 (g*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)*i^
3*(c + d*x)^2)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(204c+204dx)^3}\,dx = \int\left(\frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8489664d(c+dx)^3}+\frac{bg\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{8489664d(c+}\right.$$

$$=\frac{(bg)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(c+dx)^2}\,dx}{8489664d}-\frac{((bc-ad)g)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{(c+dx)^3}}{8489664d}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16979328d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{8489664d^2(c+dx)}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16979328d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{8489664d^2(c+dx)}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16979328d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{8489664d^2(c+dx)}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16979328d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{8489664d^2(c+dx)}$$

$$=-\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16979328d^2(c+dx)^2}+\frac{bBgn\left(A+B\log\left(e\left(\right.\right.\right.}{8489664d^2(c+}$$

$$=-\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16979328d^2(c+dx)^2}+\frac{bBgn\left(A+B\log\left(e\left(\right.\right.\right.}{8489664d^2(c+}$$

$$=-\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16979328d^2(c+dx)^2}+\frac{bBgn\left(A+B\log\left(e\left(\right.\right.\right.}{8489664d^2(c+}$$

$$=\frac{B^2(bc-ad)gn^2}{33958656d^2(c+dx)^2}-\frac{bB^2gn^2}{16979328d^2(c+dx)}-\frac{b^2B^2gn^2\log(a-}{16979328d^2(bc-}$$

$$=\frac{B^2(bc-ad)gn^2}{33958656d^2(c+dx)^2}-\frac{bB^2gn^2}{16979328d^2(c+dx)}-\frac{b^2B^2gn^2\log(a-}{16979328d^2(bc-}$$

$$=\frac{B^2(bc-ad)gn^2}{33958656d^2(c+dx)^2}-\frac{bB^2gn^2}{16979328d^2(c+dx)}-\frac{b^2B^2gn^2\log(a-}{16979328d^2(bc-}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.67, size = 803, normalized size = 5.32

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d
*i*x)^3,x]
```

```
[Out] (g*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 4*b*(b*c - a
*d)*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 4*b*B*n*(c + d*x)*
(2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b*(c + d*x)*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*B*n*(b*c - a*d + b*(c + d*x)*Lo
g[a + b*x] - b*(c + d*x)*Log[c + d*x]) - b*B*n*(c + d*x)*(Log[a + b*x]*(Log
[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/
(-(b*c) + a*d)]) + b*B*n*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) - B*
n*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b*(b*c - a*d)
*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b^2*(c + d*x)^2*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*b^2*(c + d*x)^2*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*b*B*n*(c + d*x)*(b*c - a*d
+ b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2
 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c +
d*x)^2*Log[c + d*x]) - 2*b^2*B*n*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] -
2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*
d)]) + 2*b^2*B*n*(c + d*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
+ d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(4*d^2*(
b*c - a*d)*i^3*(c + d*x)^2)
```

Maple [F]
time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{(dix+ci)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1891 vs. 2(138) = 276.
time = 0.52, size = 1891, normalized size = 12.52

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] -2*(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*lo
g(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c
 - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*
b*c^2*d^2 - I*a*c*d^3)*x))*A*B*a*g*n - 2*A*B*b*g*n*((b^2*c - 2*a*b*d)*log(b
*x + a)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c - 2*a*b*d)
*log(d*x + c)/(2*I*b^2*c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b*c^2 - 3*
a*c*d + 2*(b*c*d - 2*a*d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a*c^2*d^3 - 4*(I*b*c*d
^4 - I*a*d^5)*x^2 - 8*(I*b*c^2*d^3 - I*a*c*d^4)*x)) + (2*d*x + c)*B^2*b*g*l
og((b*x/(d*x + c) + a/(d*x + c))^n*e)^2/(2*I*d^4*x^2 + 4*I*c*d^3*x + 2*I*c^
2*d^2) - 1/4*(8*(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*
d^3) - b^2*log(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*
b*d*x + 3*b*c - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4
)*x^2 - 8*(I*b*c^2*d^2 - I*a*c*d^3)*x))*n*log((b*x/(d*x + c) + a/(d*x + c))
^n*e) + (7*I*b^2*c^2 - 8*I*a*b*c*d + I*a^2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^
2*c*d*x - I*b^2*c^2)*log(b*x + a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I
*b^2*c^2)*log(d*x + c)^2 - 6*(-I*b^2*c*d + I*a*b*d^2)*x - 6*(-I*b^2*d^2*x^2
 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a) - 2*(3*I*b^2*d^2*x^2 + 6*I*b^2*c
*d*x + 3*I*b^2*c^2 + 2*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)*log(b*x
+ a))*log(d*x + c))*n^2/(b^2*c^4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3 + (b^2*c^2
*d^3 - 2*a*b*c*d^4 + a^2*d^5)*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*
d^4)*x))*B^2*a*g - 1/4*(8*n*((b^2*c - 2*a*b*d)*log(b*x + a)/(2*I*b^2*c^2*d^
2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b^2*c - 2*a*b*d)*log(d*x + c)/(2*I*b^2*
c^2*d^2 - 4*I*a*b*c*d^3 + 2*I*a^2*d^4) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*
d^2)*x)/(-4*I*b*c^3*d^2 + 4*I*a*c^2*d^3 - 4*(I*b*c*d^4 - I*a*d^5)*x^2 - 8*(
I*b*c^2*d^3 - I*a*c*d^4)*x))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - (-I*b
^2*c^3 + 8*I*a*b*c^2*d - 7*I*a^2*c*d^2 - 2*(I*b^2*c^3 - 2*I*a*b*c^2*d + (I*
b^2*c*d^2 - 2*I*a*b*d^3)*x^2 + 2*(I*b^2*c^2*d - 2*I*a*b*c*d^2)*x)*log(b*x +
 a)^2 - 2*(I*b^2*c^3 - 2*I*a*b*c^2*d + (I*b^2*c*d^2 - 2*I*a*b*d^3)*x^2 + 2*
(I*b^2*c^2*d - 2*I*a*b*c*d^2)*x)*log(d*x + c)^2 - 2*(I*b^2*c^2*d - 5*I*a*b*
c*d^2 + 4*I*a^2*d^3)*x - 2*(I*b^2*c^3 - 4*I*a*b*c^2*d + (I*b^2*c*d^2 - 4*I*
a*b*d^3)*x^2 + 2*(I*b^2*c^2*d - 4*I*a*b*c*d^2)*x)*log(b*x + a) - 2*(-I*b^2*
c^3 + 4*I*a*b*c^2*d + (-I*b^2*c*d^2 + 4*I*a*b*d^3)*x^2 + 2*(-I*b^2*c^2*d +
4*I*a*b*c*d^2)*x + 2*(-I*b^2*c^3 + 2*I*a*b*c^2*d + (-I*b^2*c*d^2 + 2*I*a*b*
d^3)*x^2 + 2*(-I*b^2*c^2*d + 2*I*a*b*c*d^2)*x)*log(b*x + a))*log(d*x + c))*
n^2/(b^2*c^4*d^2 - 2*a*b*c^3*d^3 + a^2*c^2*d^4 + (b^2*c^2*d^4 - 2*a*b*c*d^5
 + a^2*d^6)*x^2 + 2*(b^2*c^3*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*x))*B^2*b*g +
 2*(2*d*x + c)*A*B*b*g*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(2*I*d^4*x^2
+ 4*I*c*d^3*x + 2*I*c^2*d^2) + B^2*a*g*log((b*x/(d*x + c) + a/(d*x + c))^n*
e)^2/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + (2*d*x + c)*A^2*b*g/(2*I*d^4
*x^2 + 4*I*c*d^3*x + 2*I*c^2*d^2) + 2*A*B*a*g*log((b*x/(d*x + c) + a/(d*x +
```

```
c))^n*e)/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + A^2*a*g/(2*I*d^3*x^2 +
4*I*c*d^2*x + 2*I*c^2*d)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 483 vs. $2(138) = 276$.
time = 0.37, size = 483, normalized size = 3.20

$$-\frac{(i\,B^2b^2c^2 - i\,B^2a^2d^2)gn^2 - 2\,((i\,AB + i\,B^2)b^2c^2 + (-i\,AB - i\,B^2)a^2d^2)gn - 2\,(i\,B^2b^2d^2gn^2x^2 + 2i\,B^2abd^2gn^2x + i\,B^2a^2d^2gn^2)\log\left(\frac{bx+a}{dx+c}\right)^2 - 2\,((-i\,A^2 - 2i\,AB - i\,B^2)b^2c^2 + (i\,A^2 + 2i\,AB + i\,B^2)a^2d^2)g - 2\,((-i\,B^2b^2cd + i\,B^2abd^2)gn^2 + 2\,((i\,AB + i\,B^2)b^2cd + (-i\,AB - i\,B^2)abd^2)gn + 2\,((-i\,A^2 - 2i\,AB - i\,B^2)b^2cd + (i\,A^2 + 2i\,AB + i\,B^2)abd^2)g)x - 2\,(-i\,B^2a^2d^2gn^2 + 2\,(i\,AB + i\,B^2)a^2d^2gn + (-i\,B^2b^2d^2gn^2 + 2\,(i\,AB + i\,B^2)b^2d^2gn)x^2 + 2\,(-i\,B^2abd^2gn^2 + 2\,(i\,AB + i\,B^2)abd^2gn)x)\log\left(\frac{bx+a}{dx+c}\right)}{4\,(bc^3d^2 - ac^2d^3 + (bcd^4 - ad^5)x^2 + 2\,(bc^2d^3 - acd^4)x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] -1/4*((I*B^2*b^2*c^2 - I*B^2*a^2*d^2)*g*n^2 - 2*((I*A*B + I*B^2)*b^2*c^2 +
(-I*A*B - I*B^2)*a^2*d^2)*g*n - 2*(I*B^2*b^2*d^2*g*n^2*x^2 + 2*I*B^2*a*b*d^
2*g*n^2*x + I*B^2*a^2*d^2*g*n^2)*log((b*x + a)/(d*x + c))^2 - 2*((-I*A^2 -
2*I*A*B - I*B^2)*b^2*c^2 + (I*A^2 + 2*I*A*B + I*B^2)*a^2*d^2)*g - 2*((-I*B^
2*b^2*c*d + I*B^2*a*b*d^2)*g*n^2 + 2*((I*A*B + I*B^2)*b^2*c*d + (-I*A*B - I
*B^2)*a*b*d^2)*g*n + 2*((-I*A^2 - 2*I*A*B - I*B^2)*b^2*c*d + (I*A^2 + 2*I*A
*B + I*B^2)*a*b*d^2)*g)*x - 2*(-I*B^2*a^2*d^2*g*n^2 + 2*(I*A*B + I*B^2)*a^2
*d^2*g*n + (-I*B^2*b^2*d^2*g*n^2 + 2*(I*A*B + I*B^2)*b^2*d^2*g*n)*x^2 + 2*(
-I*B^2*a*b*d^2*g*n^2 + 2*(I*A*B + I*B^2)*a*b*d^2*g*n)*x)*log((b*x + a)/(d*x
 + c)))/(b*c^3*d^2 - a*c^2*d^3 + (b*c*d^4 - a*d^5)*x^2 + 2*(b*c^2*d^3 - a*c
*d^4)*x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{g\left(\int \frac{A^2a}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{A^2bx}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{B^2a\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{2ABa\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{B^2bx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{2ABbx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx\right)}{i^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3,x)
```

```
[Out] g*(Integral(A**2*a/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + In
tegral(A**2*b*x/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integ
ral(B**2*a*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c**3 + 3*c**2*d*x +
3*c*d**2*x**2 + d**3*x**3), x) + Integral(2*A*B*a*log(e*(a/(c + d*x) + b*x/
(c + d*x))**n)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integr
al(B**2*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c**3 + 3*c**2*d*x +
 3*c*d**2*x**2 + d**3*x**3), x) + Integral(2*A*B*b*x*log(e*(a/(c + d*x) + b
*x/(c + d*x))**n)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x))/i**3
```

Giac [A]
time = 5.54, size = 178, normalized size = 1.18

$$-\frac{1}{4}\left(-\frac{2i\,(bx+a)^2B^2gn^2\log\left(\frac{bx+a}{dx+c}\right)^2}{(dx+c)^2} + \frac{2\,(i\,B^2gn^2 - 2i\,ABgn - 2i\,B^2gn)(bx+a)^2\log\left(\frac{bx+a}{dx+c}\right)}{(dx+c)^2} + \frac{(-i\,B^2gn^2 + 2i\,ABgn + 2i\,B^2gn - 2i\,A^2g - 4i\,ABg - 2i\,B^2g)(bx+a)^2}{(dx+c)^2}\right)\left(\frac{bc}{(bc-ad)^2} - \frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] -1/4*(-2*I*(b*x + a)^2*B^2*g*n^2*log((b*x + a)/(d*x + c))^2/(d*x + c)^2 + 2
*(I*B^2*g*n^2 - 2*I*A*B*g*n - 2*I*B^2*g*n)*(b*x + a)^2*log((b*x + a)/(d*x +
 c))/(d*x + c)^2 + (-I*B^2*g*n^2 + 2*I*A*B*g*n + 2*I*B^2*g*n - 2*I*A^2*g -
4*I*A*B*g - 2*I*B^2*g)*(b*x + a)^2/(d*x + c)^2)*(b*c/(b*c - a*d)^2 - a*d/(b
*c - a*d)^2)
```

Mupad [B]
time = 7.50, size = 565, normalized size = 3.74

$$-\ln\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^2\left(\frac{\frac{B^2ag}{2d}+\frac{B^2bgx}{d}+\frac{B^2bcg}{2d^2}}{c^2i^3+2cdi^3x+d^2i^3x^2}+\frac{B^2b^2g}{2d^2i^3\,(ad-bc)}\right)-\frac{x\,(2bdgA^2-2bdgABn+bdgB^2n^2)+A^2adg+A^2bcg+\frac{B^2adgn^2}{2}+\frac{B^2bcgn^2}{2}-ABadgn-ABbcgn}{2c^2d^2i^3+4cd^3i^3x+2d^4i^3x^2}-\ln\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\left(\frac{ABadg+ABbcg-B^2adgn+B^2bcgn+2ABbdgx}{c^2d^2i^3+2cd^3i^3x+d^4i^3x^2}-\frac{B^2b^2g\left(\frac{cd^2i^3n\,(ad-bc)}{2b}+\frac{d^3i^3nx\,(ad-bc)}{b}-\frac{d^2i^3n\,(ad-bc)\,(ad-2bc)}{2b^2}\right)}{d^2i^3\,(ad-bc)\,(c^2d^2i^3+2cd^3i^3x+d^4i^3x^2)}\right)-\frac{Bb^2gn\,\mathrm{atan}\left(\frac{Bb^2gn\,(2A-Bn)\left(\frac{ad^3i^3+bcd^2i^3}{d^2i^3}+2bdx\right)1\mathrm{i}}{(ad-bc)\,(B^2b^2gn^2-2ABb^2gn)}\right)(2A-Bn)\,1\mathrm{i}}{d^2i^3\,(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x)^
3,x)
```

```
[Out] - log(e*((a + b*x)/(c + d*x))^n)^2*(((B^2*a*g)/(2*d) + (B^2*b*g*x)/d + (B^2
*b*c*g)/(2*d^2))/(c^2*i^3 + d^2*i^3*x^2 + 2*c*d*i^3*x) + (B^2*b^2*g)/(2*d^2
*i^3*(a*d - b*c))) - (x*(2*A^2*b*d*g + B^2*b*d*g*n^2 - 2*A*B*b*d*g*n) + A^2
*a*d*g + A^2*b*c*g + (B^2*a*d*g*n^2)/2 + (B^2*b*c*g*n^2)/2 - A*B*a*d*g*n -
A*B*b*c*g*n)/(2*c^2*d^2*i^3 + 2*d^4*i^3*x^2 + 4*c*d^3*i^3*x) - log(e*((a +
b*x)/(c + d*x))^n)*((A*B*a*d*g + A*B*b*c*g - B^2*a*d*g*n + B^2*b*c*g*n + 2*
A*B*b*d*g*x)/(c^2*d^2*i^3 + d^4*i^3*x^2 + 2*c*d^3*i^3*x) - (B^2*b^2*g*((c*d
^2*i^3*n*(a*d - b*c))/(2*b) + (d^3*i^3*n*x*(a*d - b*c))/b - (d^2*i^3*n*(a*d
 - b*c)*(a*d - 2*b*c))/(2*b^2)))/(d^2*i^3*(a*d - b*c)*(c^2*d^2*i^3 + d^4*i^
3*x^2 + 2*c*d^3*i^3*x))) - (B*b^2*g*n*atan((B*b^2*g*n*(2*A - B*n)*((a*d^3*i
^3 + b*c*d^2*i^3)/(d^2*i^3) + 2*b*d*x)*1i)/((a*d - b*c)*(B^2*b^2*g*n^2 - 2*
A*B*b^2*g*n)))*(2*A - B*n)*1i)/(d^2*i^3*(a*d - b*c))
```

3.205 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=317

$$-\frac{B^2dn^2(a+bx)^2}{4(bc-ad)^2i^3(c+dx)^2}-\frac{2AbBn(a+bx)}{(bc-ad)^2i^3(c+dx)}+\frac{2bB^2n^2(a+bx)}{(bc-ad)^2i^3(c+dx)}-\frac{2bB^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)^2i^3(c+dx)}+\frac{Bd}{}$$

```
[Out] -1/4*B^2*d*n^2*(b*x+a)^2/(-a*d+b*c)^2/i^3/(d*x+c)^2-2*A*b*B*n*(b*x+a)/(-a*d
+b*c)^2/i^3/(d*x+c)+2*b*B^2*n^2*(b*x+a)/(-a*d+b*c)^2/i^3/(d*x+c)-2*b*B^2*n*
(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)^2/i^3/(d*x+c)+1/2*B*d*n*(b*x+a
)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^2/i^3/(d*x+c)^2-1/2*d*(b*x+a
)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^2/i^3/(d*x+c)^2+b*(b*x+a)*
(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^2/i^3/(d*x+c)
```

Rubi [A]

time = 0.11, antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.171$, Rules used = {2551, 2367, 2333, 2332, 2342, 2341}

$$\frac{Bdn(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2i^3(c+dx)^2(bc-ad)^2}+\frac{b(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^3(c+dx)(bc-ad)^2}-\frac{d(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2i^3(c+dx)^2(bc-ad)^2}-\frac{2AbBn(a+bx)}{i^3(c+dx)(bc-ad)^2}-\frac{2bB^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{i^3(c+dx)(bc-ad)^2}+\frac{2bB^2n^2(a+bx)}{i^3(c+dx)(bc-ad)^2}-\frac{B^2dn^2(a+bx)^2}{4i^3(c+dx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x)^3,x]
```

```
[Out] -1/4*(B^2*d*n^2*(a + b*x)^2)/((b*c - a*d)^2*i^3*(c + d*x)^2) - (2*A*b*B*n*(
a + b*x))/((b*c - a*d)^2*i^3*(c + d*x)) + (2*b*B^2*n^2*(a + b*x))/((b*c - a
*d)^2*i^3*(c + d*x)) - (2*b*B^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])
/((b*c - a*d)^2*i^3*(c + d*x)) + (B*d*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/(2*(b*c - a*d)^2*i^3*(c + d*x)^2) - (d*(a + b*x)^2*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^2*i^3*(c + d*x)^2) + (b*(
a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*i^3*(c +
d*x))
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2367

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2551

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(m +
1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c -
 a*d, 0] && IntegersQ[m, p] && EqQ[d*f - c*g, 0] && (GtQ[p, 0] || LtQ[m, -1
])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(205c+205dx)^3}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c+dx)^2} + \frac{(Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{42025(a+bx)(c+dx)^3}\,dx}{205d}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c+dx)^2} + \frac{(B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^3}\,dx}{8615125d}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c+dx)^2} + \frac{(B(bc-ad)n)\int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^3(a+bx)} - \cdots\right.}{\cdots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c+dx)^2} - \frac{(Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^3}\,dx}{8615125} - \frac{(b^2Bn)\int \frac{A+\cdots}{\cdots}}{861512\cdots}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d(c+dx)^2} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc-ad)(c+dx)} + \frac{b^2Bn\log(a\cdots}{8\cdots}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d(c+dx)^2} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc-ad)(c+dx)} + \frac{b^2Bn\log(a\cdots}{8\cdots}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d(c+dx)^2} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc-ad)(c+dx)} + \frac{b^2Bn\log(a\cdots}{8\cdots}$$

$$= -\frac{B^2n^2}{34460500d(c+dx)^2} - \frac{3bB^2n^2}{17230250d(bc-ad)(c+dx)} - \frac{3b^2B^2n^2\log(a+\cdots}{17230250d(bc-\cdots}$$

$$= -\frac{B^2n^2}{34460500d(c+dx)^2} - \frac{3bB^2n^2}{17230250d(bc-ad)(c+dx)} - \frac{3b^2B^2n^2\log(a+\cdots}{17230250d(bc-\cdots}$$

$$= -\frac{B^2n^2}{34460500d(c+dx)^2} - \frac{3bB^2n^2}{17230250d(bc-ad)(c+dx)} - \frac{3b^2B^2n^2\log(a+\cdots}{17230250d(bc-\cdots}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.27, size = 464, normalized size = 1.46

$$\frac{-2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2+\frac{Bn\left(2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+4b(bc-ad)(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+4b^2(c+dx)^2\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)-4b^2(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)-4bBn(c+dx)(bc-ad+b(c+dx)\log(a+bx)-b(c+dx)\log(c+dx))-Bn\left((bc-ad)^2+2b(bc-ad)(c+dx)+2b^2(c+dx)^2\log(a+bx)-2b^2(c+dx)^2\log(c+dx)\right)-2b^2Bn(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)\right)+2b^2Bn(c+dx)^2\left(\left(2\log\left(\frac{d(a+bx)}{-bc+ad}\right)-\log(c+dx)\right)\log(c+dx)+2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)}{(bc-ad)^2}}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x)^3,x]
```

```
[Out] (-2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*(b*c - a*d)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b*(b*c - a*d)*(c + d*x)*(A + B*Log[e*(
```

```
(a + b*x)/(c + d*x))^n]) + 4*b^2*(c + d*x)^2*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) - 4*b^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[c + d*x] - 4*b*B*n*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x
] - b*(c + d*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d
*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]) - 2*
b^2*B*n*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
- a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*n*(c + d*x
)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^
2)
```

Maple [**F**]
time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(dix+ci\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

Maxima [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 805 vs. 2(295) = 590.
time = 0.36, size = 805, normalized size = 2.54

$$-2\left(\frac{b^{2}\log\left(bx+a\right)}{2i\,b^{2}c^{2}d-4i\,abcd^{2}+2i\,a^{2}d^{3}}-\frac{b^{2}\log\left(dx+c\right)}{2i\,b^{2}c^{2}d-4i\,abcd^{2}+2i\,a^{2}d^{3}}-\frac{2\,bdx+3\,bc-ad}{-4i\,bc^{3}d+4i\,ac^{2}d^{2}-4\left(i\,bcd^{3}-i\,ad^{4}\right)x^{2}-8\left(i\,bc^{2}d^{2}-i\,acd^{3}\right)x}\right)ABn-\frac{1}{4}\left(8\left(\frac{b^{2}\log\left(bx+a\right)}{2i\,b^{2}c^{2}d-4i\,abcd^{2}+2i\,a^{2}d^{3}}-\frac{b^{2}\log\left(dx+c\right)}{2i\,b^{2}c^{2}d-4i\,abcd^{2}+2i\,a^{2}d^{3}}-\frac{2\,bdx+3\,bc-ad}{-4i\,bc^{3}d+4i\,ac^{2}d^{2}-4\left(i\,bcd^{3}-i\,ad^{4}\right)x^{2}-8\left(i\,bc^{2}d^{2}-i\,acd^{3}\right)x}\right)n\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)+\frac{\left(7i\,b^{2}c^{2}-8i\,abcd+i\,a^{2}d^{2}-2\left(-i\,b^{2}d^{2}x^{2}-2i\,b^{2}cdx-i\,b^{2}c^{2}\right)\log\left(bx+a\right)^{2}-2\left(-i\,b^{2}d^{2}x^{2}-2i\,b^{2}cdx-i\,b^{2}c^{2}\right)\log\left(dx+c\right)^{2}-6\left(-i\,b^{2}cd+i\,abd^{2}\right)x-6\left(-i\,b^{2}d^{2}x^{2}-2i\,b^{2}cdx-i\,b^{2}c^{2}\right)\log\left(bx+a\right)-2\left(3i\,b^{2}d^{2}x^{2}+6i\,b^{2}cdx+3i\,b^{2}c^{2}+2\left(i\,b^{2}d^{2}x^{2}+2i\,b^{2}cdx+i\,b^{2}c^{2}\right)\log\left(bx+a\right)\right)\log\left(dx+c\right)\right)n^{2}}{b^{2}c^{4}d-2\,abc^{3}d^{2}+a^{2}c^{2}d^{3}+\left(b^{2}c^{2}d^{3}-2\,abcd^{4}+a^{2}d^{5}\right)x^{2}+2\left(b^{2}c^{3}d^{2}-2\,abc^{2}d^{3}+a^{2}cd^{4}\right)x}\right)B^{2}+\frac{B^{2}\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)^{2}}{2i\,d^{3}x^{2}+4i\,cd^{2}x+2i\,c^{2}d}+\frac{2\,AB\log\left(\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}e\right)}{2i\,d^{3}x^{2}+4i\,cd^{2}x+2i\,c^{2}d}+\frac{A^{2}}{2i\,d^{3}x^{2}+4i\,cd^{2}x+2i\,c^{2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, algorithm="ma
xima")
```

```
[Out] -2*(b^2*log(b*x + a)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*lo
g(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c
 - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*
b*c^2*d^2 - I*a*c*d^3)*x))*A*B*n - 1/4*(8*(b^2*log(b*x + a)/(2*I*b^2*c^2*d
- 4*I*a*b*c*d^2 + 2*I*a^2*d^3) - b^2*log(d*x + c)/(2*I*b^2*c^2*d - 4*I*a*b*
c*d^2 + 2*I*a^2*d^3) - (2*b*d*x + 3*b*c - a*d)/(-4*I*b*c^3*d + 4*I*a*c^2*d^
2 - 4*(I*b*c*d^3 - I*a*d^4)*x^2 - 8*(I*b*c^2*d^2 - I*a*c*d^3)*x))*n*log((b*
x/(d*x + c) + a/(d*x + c))^n*e) + (7*I*b^2*c^2 - 8*I*a*b*c*d + I*a^2*d^2 -
2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a)^2 - 2*(-I*b^2*d
^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(d*x + c)^2 - 6*(-I*b^2*c*d + I*a*b*
d^2)*x - 6*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a) - 2*(3
*I*b^2*d^2*x^2 + 6*I*b^2*c*d*x + 3*I*b^2*c^2 + 2*(I*b^2*d^2*x^2 + 2*I*b^2*c
*d*x + I*b^2*c^2)*log(b*x + a))*log(d*x + c))*n^2/(b^2*c^4*d - 2*a*b*c^3*d^
```

```
2 + a^2*c^2*d^3 + (b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*x^2 + 2*(b^2*c^3*d^
2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*x))*B^2 + B^2*log((b*x/(d*x + c) + a/(d*x +
c))^n*e)^2/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + 2*A*B*log((b*x/(d*x +
c) + a/(d*x + c))^n*e)/(2*I*d^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d) + A^2/(2*I*d
^3*x^2 + 4*I*c*d^2*x + 2*I*c^2*d)
```

Fricas [A]
time = 0.40, size = 560, normalized size = 1.77

$$-\frac{2\left(iA^2+2iAB+iB^2\right)b^2c^2+4\left(-iA^2-2iAB-iB^2\right)abcd+2\left(iA^2+2iAB+iB^2\right)a^2d^2-\left(-7iB^2b^2c^2+8iB^2abcd-iB^2a^2d^2\right)n^2+2\left(-iB^2b^2d^2n^2x^2-2iB^2b^2cdn^2x+\left(-2iB^2abcd+iB^2a^2d^2\right)n^2\right)\log\left(\frac{bx+a}{dx+c}\right)^2+2\left(3\left(-iAB-iB^2\right)b^2c^2+4\left(iAB+iB^2\right)abcd+\left(-iAB-iB^2\right)a^2d^2\right)n+2\left(3\left(iB^2b^2cd-iB^2abd^2\right)n^2+2\left(\left(-iAB-iB^2\right)b^2cd+\left(iAB+iB^2\right)abd^2\right)n\right)x+2\left(\left(4iB^2abcd-iB^2a^2d^2\right)n^2+\left(3iB^2b^2d^2n^2+2\left(-iAB-iB^2\right)b^2d^2n\right)x^2+2\left(2\left(-iAB-iB^2\right)abcd+\left(iAB+iB^2\right)a^2d^2\right)n+2\left(2\left(-iAB-iB^2\right)b^2cdn+\left(2iB^2b^2cd+iB^2abd^2\right)n^2\right)x\right)\log\left(\frac{bx+a}{dx+c}\right)}{4\left(b^2c^4d-2abc^3d^2+a^2c^2d^3+\left(b^2c^2d^3-2abcd^4+a^2d^5\right)x^2+2\left(b^2c^3d^2-2abc^2d^3+a^2cd^4\right)x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, algorithm="fr
icas")
```

```
[Out] -1/4*(2*(I*A^2 + 2*I*A*B + I*B^2)*b^2*c^2 + 4*(-I*A^2 - 2*I*A*B - I*B^2)*a*
b*c*d + 2*(I*A^2 + 2*I*A*B + I*B^2)*a^2*d^2 - (-7*I*B^2*b^2*c^2 + 8*I*B^2*a
*b*c*d - I*B^2*a^2*d^2)*n^2 + 2*(-I*B^2*b^2*d^2*n^2*x^2 - 2*I*B^2*b^2*c*d*n
^2*x + (-2*I*B^2*a*b*c*d + I*B^2*a^2*d^2)*n^2)*log((b*x + a)/(d*x + c))^2 +
 2*(3*(-I*A*B - I*B^2)*b^2*c^2 + 4*(I*A*B + I*B^2)*a*b*c*d + (-I*A*B - I*B^
2)*a^2*d^2)*n + 2*(3*(I*B^2*b^2*c*d - I*B^2*a*b*d^2)*n^2 + 2*((-I*A*B - I*B
^2)*b^2*c*d + (I*A*B + I*B^2)*a*b*d^2)*n)*x + 2*((4*I*B^2*a*b*c*d - I*B^2*a
^2*d^2)*n^2 + (3*I*B^2*b^2*d^2*n^2 + 2*(-I*A*B - I*B^2)*b^2*d^2*n)*x^2 + 2*
(2*(-I*A*B - I*B^2)*a*b*c*d + (I*A*B + I*B^2)*a^2*d^2)*n + 2*(2*(-I*A*B - I
*B^2)*b^2*c*d*n + (2*I*B^2*b^2*c*d + I*B^2*a*b*d^2)*n^2)*x)*log((b*x + a)/(
d*x + c)))/(b^2*c^4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3 + (b^2*c^2*d^3 - 2*a*b*
c*d^4 + a^2*d^5)*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx}{i^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3,x)
```

```
[Out] (Integral(A**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integr
al(B**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c**3 + 3*c**2*d*x + 3*c
*d**2*x**2 + d**3*x**3), x) + Integral(2*A*B*log(e*(a/(c + d*x) + b*x/(c +
d*x))**n)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x))/i**3
```

Giac [A]
time = 6.40, size = 355, normalized size = 1.12

$$-\frac{1}{4}\left(2\left(-\frac{2i(bx+a)B^2bn^2}{(bc-ad)(dx+c)}+\frac{i(bx+a)^2B^2dn^2}{(bc-ad)(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)^2+2\left(\frac{\left(-iB^2dn^2+2iABdn+2iB^2dn\right)(bx+a)^2}{(bc-ad)(dx+c)^2}-\frac{4\left(-iB^2bn^2+iABbn+iB^2bn\right)(bx+a)}{(bc-ad)(dx+c)}\right)\log\left(\frac{bx+a}{dx+c}\right)+\frac{\left(iB^2dn^2-2iABdn-2iB^2dn+2iA^2d+4iABd+2iB^2d\right)(bx+a)^2}{(bc-ad)(dx+c)^2}+\frac{4\left(-2iB^2bn^2+2iABbn+2iB^2bn-iA^2b-2iABb-iB^2b\right)(bx+a)}{(bc-ad)(dx+c)}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, algorithm="gi
ac")
```

```
[Out] -1/4*(2*(-2*I*(b*x + a)*B^2*b*n^2/((b*c - a*d)*(d*x + c)) + I*(b*x + a)^2*B
^2*d*n^2/((b*c - a*d)*(d*x + c)^2))*log((b*x + a)/(d*x + c))^2 + 2*((-I*B^2
*d*n^2 + 2*I*A*B*d*n + 2*I*B^2*d*n)*(b*x + a)^2/((b*c - a*d)*(d*x + c)^2) -
 4*(-I*B^2*b*n^2 + I*A*B*b*n + I*B^2*b*n)*(b*x + a)/((b*c - a*d)*(d*x + c))
)*log((b*x + a)/(d*x + c)) + (I*B^2*d*n^2 - 2*I*A*B*d*n - 2*I*B^2*d*n + 2*I
*A^2*d + 4*I*A*B*d + 2*I*B^2*d)*(b*x + a)^2/((b*c - a*d)*(d*x + c)^2) + 4*(
-2*I*B^2*b*n^2 + 2*I*A*B*b*n + 2*I*B^2*b*n - I*A^2*b - 2*I*A*B*b - I*B^2*b)
*(b*x + a)/((b*c - a*d)*(d*x + c)))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

Mupad [B]
time = 6.67, size = 505, normalized size = 1.59

$$-\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^2\left(\frac{B^2}{2\,d\,\left(c^2\,i^3+2\,c\,d\,i^3\,x+d^2\,i^3\,x^2\right)}-\frac{B^2\,b^2}{2\,d\,i^3\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)-\frac{\frac{2\,A^2\,a\,d-2\,A^2\,b\,c+B^2\,a\,d\,n^2-7\,B^2\,b\,c\,n^2-2\,A\,B\,a\,d\,n+6\,A\,B\,b\,c\,n}{2\,\left(a\,d-b\,c\right)}-\frac{b\,x\,\left(3\,B^2\,d\,n^2-2\,A\,B\,d\,n\right)}{a\,d-b\,c}}{2\,c^2\,d\,i^3+4\,c\,d^2\,i^3\,x+2\,d^3\,i^3\,x^2}-\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\,\left(\frac{A\,B}{c^2\,d\,i^3+2\,c\,d^2\,i^3\,x+d^3\,i^3\,x^2}+\frac{B^2\,b^2\,\left(\frac{d^2\,i^3\,n\,x\,\left(a\,d-b\,c\right)}{b}-\frac{d\,i^3\,n\,\left(a\,d-b\,c\right)\,\left(a\,d-2\,b\,c\right)}{2\,b^2}+\frac{c\,d\,i^3\,n\,\left(a\,d-b\,c\right)}{2\,b}\right)}{d\,i^3\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)\,\left(c^2\,d\,i^3+2\,c\,d^2\,i^3\,x+d^3\,i^3\,x^2\right)}\right)-\frac{B\,b^2\,n\,\mathrm{atan}\left(\frac{\left(2\,b\,d\,x+\frac{2\,a^2\,d^3\,i^3-2\,b^2\,c^2\,d\,i^3}{2\,d\,i^3\,\left(a\,d-b\,c\right)}\right)\,1{}\mathrm{i}}{a\,d-b\,c}\right)\,\left(2\,A-3\,B\,n\right)\,1{}\mathrm{i}}{d\,i^3\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*i + d*i*x)^3,x)
```

```
[Out] - log(e*((a + b*x)/(c + d*x))^n)^2*(B^2/(2*d*(c^2*i^3 + d^2*i^3*x^2 + 2*c*d
*i^3*x)) - (B^2*b^2)/(2*d*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - ((2*A^2*a
*d - 2*A^2*b*c + B^2*a*d*n^2 - 7*B^2*b*c*n^2 - 2*A*B*a*d*n + 6*A*B*b*c*n)/(
2*(a*d - b*c)) - (b*x*(3*B^2*d*n^2 - 2*A*B*d*n))/(a*d - b*c))/(2*c^2*d*i^3
+ 2*d^3*i^3*x^2 + 4*c*d^2*i^3*x) - log(e*((a + b*x)/(c + d*x))^n)*((A*B)/(c
^2*d*i^3 + d^3*i^3*x^2 + 2*c*d^2*i^3*x) + (B^2*b^2*((d^2*i^3*n*x*(a*d - b*c
))/b - (d*i^3*n*(a*d - b*c)*(a*d - 2*b*c))/(2*b^2) + (c*d*i^3*n*(a*d - b*c)
)/(2*b)))/(d*i^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(c^2*d*i^3 + d^3*i^3*x^2 +
 2*c*d^2*i^3*x))) - (B*b^2*n*atan(((2*b*d*x + (2*a^2*d^3*i^3 - 2*b^2*c^2*d*
i^3)/(2*d*i^3*(a*d - b*c)))*1i)/(a*d - b*c))*(2*A - 3*B*n)*1i)/(d*i^3*(a*d
- b*c)^2)
```

3.206 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)^3}\,dx$

Optimal. Leaf size=402

$$\frac{B^2d^2n^2(a+bx)^2}{4(bc-ad)^3gi^3(c+dx)^2}+\frac{4AbBdn(a+bx)}{(bc-ad)^3gi^3(c+dx)}-\frac{4bB^2dn^2(a+bx)}{(bc-ad)^3gi^3(c+dx)}+\frac{4bB^2dn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)^3gi^3(c+dx)}-$$

```
[Out] 1/4*B^2*d^2*n^2*(b*x+a)^2/(-a*d+b*c)^3/g/i^3/(d*x+c)^2+4*A*b*B*d*n*(b*x+a)/
(-a*d+b*c)^3/g/i^3/(d*x+c)-4*b*B^2*d*n^2*(b*x+a)/(-a*d+b*c)^3/g/i^3/(d*x+c)
+4*b*B^2*d*n*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)^3/g/i^3/(d*x+c)-1
/2*B*d^2*n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g/i^3/(d*
x+c)^2+1/2*d^2*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g/i
^3/(d*x+c)^2-2*b*d*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g
/i^3/(d*x+c)+1/3*b^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3/B/(-a*d+b*c)^3/g/i^3
/n
```

Rubi [A]

time = 0.31, antiderivative size = 402, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2561, 2388, 2339, 30, 2333, 2332, 2367, 2342, 2341}

$$\frac{b^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bgi^3n(bc-ad)^3}+\frac{d^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{Bd^2n(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{2bd(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{gi^3(c+dx)(bc-ad)^3}+\frac{4AbBdn(a+bx)}{gi^3(c+dx)(bc-ad)^3}+\frac{B^2d^2n^2(a+bx)^2}{4gi^3(c+dx)^2(bc-ad)^3}+\frac{4bB^2dn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{gi^3(c+dx)(bc-ad)^3}-\frac{4bB^2dn^2(a+bx)}{gi^3(c+dx)(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*i*x)^3
),x]
```

```
[Out] (B^2*d^2*n^2*(a + b*x)^2)/(4*(b*c - a*d)^3*g*i^3*(c + d*x)^2) + (4*A*b*B*d*
n*(a + b*x))/((b*c - a*d)^3*g*i^3*(c + d*x)) - (4*b*B^2*d*n^2*(a + b*x))/((
b*c - a*d)^3*g*i^3*(c + d*x)) + (4*b*B^2*d*n*(a + b*x)*Log[e*((a + b*x)/(c
+ d*x))^n])/((b*c - a*d)^3*g*i^3*(c + d*x)) - (B*d^2*n*(a + b*x)^2*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) + (d^2*
(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^3*g*i^
3*(c + d*x)^2) - (2*b*d*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)
/((b*c - a*d)^3*g*i^3*(c + d*x)) + (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^3)/(3*B*(b*c - a*d)^3*g*i^3*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2367

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2388

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[(d + e*x)^(q - 1)*((a + b*Log[c*x^n])^p/x),
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(206c+206dx)^3(ag+bgx)}\,dx=\int\left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^3g(a+bx)}-\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)g(c+dx)^3}-\frac{bd(}{8741}\right.$$

$$=\frac{b^3\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{8741816(bc-ad)^3g}-\frac{(b^2d)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{8741816(bc-ad)^3g}-\frac{(bd)\int}{874}$$

$$=\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc-ad)g(c+dx)^2}+\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^2g(c+dx)}+\frac{b^2\log(a}{}$$

$$=\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc-ad)g(c+dx)^2}+\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^2g(c+dx)}+\frac{b^2\log(a}{}$$

$$=\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc-ad)g(c+dx)^2}+\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^2g(c+dx)}+\frac{b^2\log(a}{}$$

$$=\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc-ad)g(c+dx)^2}+\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^2g(c+dx)}+\frac{b^2\log(a}{}$$

$$=-\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17483632(bc-ad)g(c+dx)^2}-\frac{3bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8741816(bc-ad)^2g(c+dx)}-\frac{3b^2B}{}$$

$$=-\frac{b^2B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{8741816(bc-ad)^3g}-\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17483632(bc-ad)g(c+dx)^2}-\frac{3l}{8}$$

$$=-\frac{b^2B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{8741816(bc-ad)^3g}-\frac{b^2B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{8741816(bc-ad)^3g}$$

$$=\frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2}+\frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)}+\frac{7b^2B^2n}{174836}$$

$$=\frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2}+\frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)}+\frac{7b^2B^2n}{174836}$$

$$=\frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2}+\frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)}+\frac{7b^2B^2n}{174836}$$

$$=\frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2}+\frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)}+\frac{7b^2B^2n}{174836}$$

$$=\frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2}+\frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)}+\frac{7b^2B^2n}{174836}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 971 vs. 2(402) = 804.
time = 0.75, size = 971, normalized size = 2.42

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*
i*x)^3),x]
```

```
[Out] (4*b^2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^3 - (6*B*n*Log[(a + b*x)/(c + d*x)]
^2*(-2*A*b^2*c^2 + 4*a*b*B*c*d*n - a^2*B*d^2*n - 4*A*b^2*c*d*x + 4*b^2*B*c*
d*n*x + 2*a*b*B*d^2*n*x - 2*A*b^2*d^2*x^2 + 3*b^2*B*d^2*n*x^2 - 2*b^2*B*(c
+ d*x)^2*Log[e*((a + b*x)/(c + d*x))^n] + 2*b^2*B*n*(c + d*x)^2*Log[(a + b*
x)/(c + d*x)]))/(c + d*x)^2 - (6*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d*x)]*(
-6*A*b*c + 2*a*A*d + 7*b*B*c*n - a*B*d*n - 4*A*b*d*x + 6*b*B*d*n*x + 2*B*(-
3*b*c + a*d - 2*b*d*x)*Log[e*((a + b*x)/(c + d*x))^n] + 2*B*n*(3*b*c - a*d
+ 2*b*d*x)*Log[(a + b*x)/(c + d*x)]))/(c + d*x)^2 + (3*(b*c - a*d)^2*(2*A^2
 - 2*A*B*n + B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A
 + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2
*B*Log[e*((a + b*x)/(c + d*x))^n]*(-2*A + B*n + 2*B*n*Log[(a + b*x)/(c + d*
x)])))/(c + d*x)^2 + (6*b*(b*c - a*d)*(2*A^2 - 6*A*B*n + 7*B^2*n^2 + 2*B^2*
Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + 3*B*n)*Log[(a + b*x)/(c +
d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*
x))^n]*(-2*A + 3*B*n + 2*B*n*Log[(a + b*x)/(c + d*x)])))/(c + d*x) + 6*b^2*
Log[a + b*x]*(2*A^2 - 6*A*B*n + 7*B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x
))^n]^2 + 2*B*n*(-2*A + 3*B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a
+ b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-2*A + 3*B*n + 2*
B*n*Log[(a + b*x)/(c + d*x)])) - 6*b^2*(2*A^2 - 6*A*B*n + 7*B^2*n^2 + 2*B^2
*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + 3*B*n)*Log[(a + b*x)/(c +
 d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d
*x))^n]*(-2*A + 3*B*n + 2*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c + d*x])/(12*
(b*c - a*d)^3*g*i^3)
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(bgx+ag\right)\left(dix+ci\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2035 vs. 2(375) = 750.
time = 0.68, size = 2035, normalized size = 5.06

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B^2*(2*b^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^
2 + I*a^3*d^3)*g) - 2*b^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d - 3*I
*a^2*b*c*d^2 + I*a^3*d^3)*g) + (2*b*d*x + 3*b*c - a*d)/((-I*b^2*c^2*d^2 + 2
*I*a*b*c*d^3 - I*a^2*d^4)*g*x^2 + 2*(-I*b^2*c^3*d + 2*I*a*b*c^2*d^2 - I*a^2
*c*d^3)*g*x + (-I*b^2*c^4 + 2*I*a*b*c^3*d - I*a^2*c^2*d^2)*g))*log((b*x/(d*
x + c) + a/(d*x + c))^n*e)^2 + A*B*(2*b^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a
*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) - 2*b^2*log(d*x + c)/((-I*b^3*
c^3 + 3*I*a*b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) + (2*b*d*x + 3*b*c
- a*d)/((-I*b^2*c^2*d^2 + 2*I*a*b*c*d^3 - I*a^2*d^4)*g*x^2 + 2*(-I*b^2*c^3*
d + 2*I*a*b*c^2*d^2 - I*a^2*c*d^3)*g*x + (-I*b^2*c^4 + 2*I*a*b*c^3*d - I*a^
2*c^2*d^2)*g))*log((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/12*((-45*I*b^2*c^
2 + 48*I*a*b*c*d - 3*I*a^2*d^2 - 4*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c
^2)*log(b*x + a)^3 - 4*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(d*x
 + c)^3 - 18*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)*log(b*x + a)^2 - 6
*(3*I*b^2*d^2*x^2 + 6*I*b^2*c*d*x + 3*I*b^2*c^2 + 2*(I*b^2*d^2*x^2 + 2*I*b^
2*c*d*x + I*b^2*c^2)*log(b*x + a))*log(d*x + c)^2 - 42*(I*b^2*c*d - I*a*b*d
^2)*x - 42*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)*log(b*x + a) - 6*(-7
*I*b^2*d^2*x^2 - 14*I*b^2*c*d*x - 7*I*b^2*c^2 + 2*(-I*b^2*d^2*x^2 - 2*I*b^2
*c*d*x - I*b^2*c^2)*log(b*x + a)^2 + 6*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*
b^2*c^2)*log(b*x + a))*log(d*x + c))*n^2/(b^3*c^5*g - 3*a*b^2*c^4*d*g + 3*a
^2*b*c^3*d^2*g - a^3*c^2*d^3*g + (b^3*c^3*d^2*g - 3*a*b^2*c^2*d^3*g + 3*a^2
*b*c*d^4*g - a^3*d^5*g)*x^2 + 2*(b^3*c^4*d*g - 3*a*b^2*c^3*d^2*g + 3*a^2*b*
c^2*d^3*g - a^3*c*d^4*g)*x) + 6*(7*I*b^2*c^2 - 8*I*a*b*c*d + I*a^2*d^2 - 2*
(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a)^2 - 2*(-I*b^2*d^2
*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(d*x + c)^2 - 6*(-I*b^2*c*d + I*a*b*d^
2)*x - 6*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a) - 2*(3*I
*b^2*d^2*x^2 + 6*I*b^2*c*d*x + 3*I*b^2*c^2 + 2*(I*b^2*d^2*x^2 + 2*I*b^2*c*d
*x + I*b^2*c^2)*log(b*x + a))*log(d*x + c))*n*log((b*x/(d*x + c) + a/(d*x +
 c))^n*e)/(b^3*c^5*g - 3*a*b^2*c^4*d*g + 3*a^2*b*c^3*d^2*g - a^3*c^2*d^3*g
+ (b^3*c^3*d^2*g - 3*a*b^2*c^2*d^3*g + 3*a^2*b*c*d^4*g - a^3*d^5*g)*x^2 + 2
*(b^3*c^4*d*g - 3*a*b^2*c^3*d^2*g + 3*a^2*b*c^2*d^3*g - a^3*c*d^4*g)*x))*B^
2 - 1/2*(7*I*b^2*c^2 - 8*I*a*b*c*d + I*a^2*d^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^
2*c*d*x - I*b^2*c^2)*log(b*x + a)^2 - 2*(-I*b^2*d^2*x^2 - 2*I*b^2*c*d*x - I
*b^2*c^2)*log(d*x + c)^2 - 6*(-I*b^2*c*d + I*a*b*d^2)*x - 6*(-I*b^2*d^2*x^2
 - 2*I*b^2*c*d*x - I*b^2*c^2)*log(b*x + a) - 2*(3*I*b^2*d^2*x^2 + 6*I*b^2*c
```

```
*d*x + 3*I*b^2*c^2 + 2*(I*b^2*d^2*x^2 + 2*I*b^2*c*d*x + I*b^2*c^2)*log(b*x
+ a))*log(d*x + c))*A*B*n/(b^3*c^5*g - 3*a*b^2*c^4*d*g + 3*a^2*b*c^3*d^2*g
- a^3*c^2*d^3*g + (b^3*c^3*d^2*g - 3*a*b^2*c^2*d^3*g + 3*a^2*b*c*d^4*g - a^
3*d^5*g)*x^2 + 2*(b^3*c^4*d*g - 3*a*b^2*c^3*d^2*g + 3*a^2*b*c^2*d^3*g - a^3
*c*d^4*g)*x) + 1/2*A^2*(2*b^2*log(b*x + a)/((-I*b^3*c^3 + 3*I*a*b^2*c^2*d -
 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) - 2*b^2*log(d*x + c)/((-I*b^3*c^3 + 3*I*a*
b^2*c^2*d - 3*I*a^2*b*c*d^2 + I*a^3*d^3)*g) + (2*b*d*x + 3*b*c - a*d)/((-I*
b^2*c^2*d^2 + 2*I*a*b*c*d^3 - I*a^2*d^4)*g*x^2 + 2*(-I*b^2*c^3*d + 2*I*a*b*
c^2*d^2 - I*a^2*c*d^3)*g*x + (-I*b^2*c^4 + 2*I*a*b*c^3*d - I*a^2*c^2*d^2)*g
))
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 873 vs. $2(375) = 750$.
time = 0.45, size = 873, normalized size = 2.17

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] 1/12*(18*(I*A^2 + 2*I*A*B + I*B^2)*b^2*c^2 + 24*(-I*A^2 - 2*I*A*B - I*B^2)*
a*b*c*d + 6*(I*A^2 + 2*I*A*B + I*B^2)*a^2*d^2 + 4*(I*B^2*b^2*d^2*n^2*x^2 +
2*I*B^2*b^2*c*d*n^2*x + I*B^2*b^2*c^2*n^2)*log((b*x + a)/(d*x + c))^3 + 3*(
15*I*B^2*b^2*c^2 - 16*I*B^2*a*b*c*d + I*B^2*a^2*d^2)*n^2 + 6*(2*(I*A*B + I*
B^2)*b^2*c^2*n + (-4*I*B^2*a*b*c*d + I*B^2*a^2*d^2)*n^2 + (-3*I*B^2*b^2*d^2
*n^2 + 2*(I*A*B + I*B^2)*b^2*d^2*n)*x^2 + 2*(2*(I*A*B + I*B^2)*b^2*c*d*n +
(-2*I*B^2*b^2*c*d - I*B^2*a*b*d^2)*n^2)*x)*log((b*x + a)/(d*x + c))^2 + 6*(
7*(-I*A*B - I*B^2)*b^2*c^2 + 8*(I*A*B + I*B^2)*a*b*c*d + (-I*A*B - I*B^2)*a
^2*d^2)*n + 6*(2*(I*A^2 + 2*I*A*B + I*B^2)*b^2*c*d + 2*(-I*A^2 - 2*I*A*B -
I*B^2)*a*b*d^2 + 7*(I*B^2*b^2*c*d - I*B^2*a*b*d^2)*n^2 + 6*((-I*A*B - I*B^2
)*b^2*c*d + (I*A*B + I*B^2)*a*b*d^2)*n)*x + 6*(2*(I*A^2 + 2*I*A*B + I*B^2)*
b^2*c^2 + (8*I*B^2*a*b*c*d - I*B^2*a^2*d^2)*n^2 + (7*I*B^2*b^2*d^2*n^2 + 6*
(-I*A*B - I*B^2)*b^2*d^2*n + 2*(I*A^2 + 2*I*A*B + I*B^2)*b^2*d^2)*x^2 + 2*(
4*(-I*A*B - I*B^2)*a*b*c*d + (I*A*B + I*B^2)*a^2*d^2)*n + 2*(2*(I*A^2 + 2*I
*A*B + I*B^2)*b^2*c*d + (4*I*B^2*b^2*c*d + 3*I*B^2*a*b*d^2)*n^2 + 2*(2*(-I*
A*B - I*B^2)*b^2*c*d + (-I*A*B - I*B^2)*a*b*d^2)*n)*x)*log((b*x + a)/(d*x +
 c)))/((b^3*c^3*d^2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c*d^4 - a^3*d^5)*g*x^2 + 2*
(b^3*c^4*d - 3*a*b^2*c^3*d^2 + 3*a^2*b*c^2*d^3 - a^3*c*d^4)*g*x + (b^3*c^5
- 3*a*b^2*c^4*d + 3*a^2*b*c^3*d^2 - a^3*c^2*d^3)*g)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.74, size = 647, normalized size = 1.61

$$-\frac{1}{12}\left(-\frac{4i\,B^2b^2n^2\log\left(\frac{bx+a}{dx+c}\right)^3}{b^2c^2g-2\,abcdg+a^2d^2g}+6\left(\frac{4i\,(bx+a)B^2bdn^2}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)}-\frac{i\,(bx+a)^2B^2d^2n^2}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)^2}+\frac{2\,(-i\,ABb^2n-i\,B^2b^2n)}{b^2c^2g-2\,abcdg+a^2d^2g}\right)\log\left(\frac{bx+a}{dx+c}\right)^2-6\left(\frac{(-i\,B^2d^2n^2+2i\,ABd^2n+2i\,B^2d^2n)(bx+a)^2}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)^2}-\frac{8\,(-i\,B^2bdn^2+i\,ABbdn+i\,B^2bdn)(bx+a)}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)}\right)\log\left(\frac{bx+a}{dx+c}\right)+\frac{12\,(A^2b^2+2\,ABb^2+B^2b^2)\log\left(\frac{bx+a}{dx+c}\right)}{i\,b^2c^2g-2i\,abcdg+i\,a^2d^2g}-\frac{3\,(i\,B^2d^2n^2-2i\,ABd^2n-2i\,B^2d^2n+2i\,A^2d^2+4i\,ABd^2+2i\,B^2d^2)(bx+a)^2}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)^2}+\frac{24\,(2i\,B^2bdn^2-2i\,ABbdn-2i\,B^2bdn+i\,A^2bd+2i\,ABbd+i\,B^2bd)(bx+a)}{(b^2c^2g-2\,abcdg+a^2d^2g)(dx+c)}\right)\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] -1/12*(-4*I*B^2*b^2*n^2*log((b*x + a)/(d*x + c))^3/(b^2*c^2*g - 2*a*b*c*d*g
 + a^2*d^2*g) + 6*(4*I*(b*x + a)*B^2*b*d*n^2/((b^2*c^2*g - 2*a*b*c*d*g + a^
2*d^2*g)*(d*x + c)) - I*(b*x + a)^2*B^2*d^2*n^2/((b^2*c^2*g - 2*a*b*c*d*g +
 a^2*d^2*g)*(d*x + c)^2) + 2*(-I*A*B*b^2*n - I*B^2*b^2*n)/(b^2*c^2*g - 2*a*
b*c*d*g + a^2*d^2*g))*log((b*x + a)/(d*x + c))^2 - 6*((-I*B^2*d^2*n^2 + 2*I
*A*B*d^2*n + 2*I*B^2*d^2*n)*(b*x + a)^2/((b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2
*g)*(d*x + c)^2) - 8*(-I*B^2*b*d*n^2 + I*A*B*b*d*n + I*B^2*b*d*n)*(b*x + a)
/((b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(d*x + c)))*log((b*x + a)/(d*x + c)
) + 12*(A^2*b^2 + 2*A*B*b^2 + B^2*b^2)*log((b*x + a)/(d*x + c))/(I*b^2*c^2*
g - 2*I*a*b*c*d*g + I*a^2*d^2*g) - 3*(I*B^2*d^2*n^2 - 2*I*A*B*d^2*n - 2*I*B
^2*d^2*n + 2*I*A^2*d^2 + 4*I*A*B*d^2 + 2*I*B^2*d^2)*(b*x + a)^2/((b^2*c^2*g
 - 2*a*b*c*d*g + a^2*d^2*g)*(d*x + c)^2) + 24*(2*I*B^2*b*d*n^2 - 2*I*A*B*b*
d*n - 2*I*B^2*b*d*n + I*A^2*b*d + 2*I*A*B*b*d + I*B^2*b*d)*(b*x + a)/((b^2*
c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(d*x + c)))*(b*c/(b*c - a*d)^2 - a*d/(b*c
- a*d)^2)
```

Mupad [B]
time = 8.73, size = 1007, normalized size = 2.50

$$\ln\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^2\left(\frac{b^2\,(3\,B^2\,n-2\,A\,B)}{2\,g\,i^3\,n\,(a\,d-b\,c)\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}+\frac{B^2\,b^2\left(\frac{c\,g\,i^3\,n\,(a\,d-b\,c)}{2\,b}-\frac{g\,i^3\,n\,(a\,d-b\,c)\,(a\,d-2\,b\,c)}{2\,b^2}+\frac{d\,g\,i^3\,n\,x\,(a\,d-b\,c)}{b}\right)}{g\,i^3\,n\,(a\,d-b\,c)\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)\,(g\,c^2\,i^3+2\,g\,c\,d\,i^3\,x+g\,d^2\,i^3\,x^2)}\right)-\frac{\frac{2\,A^2\,a\,d-6\,A^2\,b\,c+B^2\,a\,d\,n^2-15\,B^2\,b\,c\,n^2-2\,A\,B\,a\,d\,n+14\,A\,B\,b\,c\,n}{2\,(a\,d-b\,c)}-\frac{x\,(2\,b\,d\,A^2-6\,b\,d\,A\,B\,n+7\,b\,d\,B^2\,n^2)}{a\,d-b\,c}}{x^2\,(2\,a\,d^3\,g\,i^3-2\,b\,c\,d^2\,g\,i^3)+x\,(4\,a\,c\,d^2\,g\,i^3-4\,b\,c^2\,d\,g\,i^3)-2\,b\,c^3\,g\,i^3+2\,a\,c^2\,d\,g\,i^3}-\ln\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\left(\frac{B^2\,n}{x^2\,(a\,d^3\,g\,i^3-b\,c\,d^2\,g\,i^3)+x\,(2\,a\,c\,d^2\,g\,i^3-2\,b\,c^2\,d\,g\,i^3)-b\,c^3\,g\,i^3+a\,c^2\,d\,g\,i^3}+\frac{b^2\,(3\,B^2\,n-2\,A\,B)\left(\frac{c\,g\,i^3\,n\,(a\,d-b\,c)^2}{2\,b}-\frac{g\,i^3\,n\,(a\,d-b\,c)^2\,(a\,d-2\,b\,c)}{2\,b^2}+\frac{d\,g\,i^3\,n\,x\,(a\,d-b\,c)^2}{b}\right)}{g\,i^3\,n\,(a\,d-b\,c)\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)\,(x^2\,(a\,d^3\,g\,i^3-b\,c\,d^2\,g\,i^3)+x\,(2\,a\,c\,d^2\,g\,i^3-2\,b\,c^2\,d\,g\,i^3)-b\,c^3\,g\,i^3+a\,c^2\,d\,g\,i^3)}\right)-\frac{B^2\,b^2\ln\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^3}{3\,g\,i^3\,n\,(a\,d-b\,c)\,(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2)}+\frac{b^2\,\mathrm{atan}\left(\frac{b^2\left(\frac{g\,a^3\,d^3\,i^3-g\,a^2\,b\,c\,d^2\,i^3-g\,a\,b^2\,c^2\,d\,i^3+g\,b^3\,c^3\,i^3}{g\,a^2\,d^2\,i^3-2\,g\,a\,b\,c\,d\,i^3+g\,b^2\,c^2\,i^3}+2\,b\,d\,x\right)\left(A^2-3\,A\,B\,n+\frac{7\,B^2\,n^2}{2}\right)(g\,a^2\,d^2\,i^3-2\,g\,a\,b\,c\,d\,i^3+g\,b^2\,c^2\,i^3)\,2i}{g\,i^3\,(a\,d-b\,c)^2\,(2\,A^2\,b^2-6\,A\,B\,b^2\,n+7\,B^2\,b^2\,n^2)}\right)\left(A^2-3\,A\,B\,n+\frac{7\,B^2\,n^2}{2}\right)2i}{g\,i^3\,(a\,d-b\,c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)*(c*i + d*i*x)^3
),x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)^2*((b^2*(3*B^2*n - 2*A*B))/(2*g*i^3*n*(a*d -
 b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (B^2*b^2*((c*g*i^3*n*(a*d - b*c))/
(2*b) - (g*i^3*n*(a*d - b*c)*(a*d - 2*b*c))/(2*b^2) + (d*g*i^3*n*x*(a*d - b
*c))/b))/(g*i^3*n*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(c^2*g*i^3 +
d^2*g*i^3*x^2 + 2*c*d*g*i^3*x))) - ((2*A^2*a*d - 6*A^2*b*c + B^2*a*d*n^2 -
15*B^2*b*c*n^2 - 2*A*B*a*d*n + 14*A*B*b*c*n)/(2*(a*d - b*c)) - (x*(2*A^2*b*
d + 7*B^2*b*d*n^2 - 6*A*B*b*d*n))/(a*d - b*c))/(x^2*(2*a*d^3*g*i^3 - 2*b*c*
d^2*g*i^3) + x*(4*a*c*d^2*g*i^3 - 4*b*c^2*d*g*i^3) - 2*b*c^3*g*i^3 + 2*a*c^
```

```
2*d*g*i^3) - log(e*((a + b*x)/(c + d*x))^n)*((B^2*n)/(x^2*(a*d^3*g*i^3 - b*
c*d^2*g*i^3) + x*(2*a*c*d^2*g*i^3 - 2*b*c^2*d*g*i^3) - b*c^3*g*i^3 + a*c^2*
d*g*i^3) + (b^2*(3*B^2*n - 2*A*B)*((c*g*i^3*n*(a*d - b*c)^2)/(2*b) - (g*i^3
*n*(a*d - b*c)^2*(a*d - 2*b*c))/(2*b^2) + (d*g*i^3*n*x*(a*d - b*c)^2)/b))/(
g*i^3*n*(a*d - b*c)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(x^2*(a*d^3*g*i^3 - b*c
*d^2*g*i^3) + x*(2*a*c*d^2*g*i^3 - 2*b*c^2*d*g*i^3) - b*c^3*g*i^3 + a*c^2*d
*g*i^3))) + (b^2*atan((b^2*((a^3*d^3*g*i^3 + b^3*c^3*g*i^3 - a*b^2*c^2*d*g*
i^3 - a^2*b*c*d^2*g*i^3)/(a^2*d^2*g*i^3 + b^2*c^2*g*i^3 - 2*a*b*c*d*g*i^3)
+ 2*b*d*x)*(A^2 + (7*B^2*n^2)/2 - 3*A*B*n)*(a^2*d^2*g*i^3 + b^2*c^2*g*i^3 -
 2*a*b*c*d*g*i^3)*2i)/(g*i^3*(a*d - b*c)^3*(2*A^2*b^2 + 7*B^2*b^2*n^2 - 6*A
*B*b^2*n)))*(A^2 + (7*B^2*n^2)/2 - 3*A*B*n)*2i)/(g*i^3*(a*d - b*c)^3) - (B^
2*b^2*log(e*((a + b*x)/(c + d*x))^n)^3)/(3*g*i^3*n*(a*d - b*c)*(a^2*d^2 + b
^2*c^2 - 2*a*b*c*d))
```

3.207 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)^3}\,dx$

Optimal. Leaf size=562

$$-\frac{B^2d^3n^2(a+bx)^2}{4(bc-ad)^4g^2i^3(c+dx)^2}-\frac{6AbBd^2n(a+bx)}{(bc-ad)^4g^2i^3(c+dx)}+\frac{6bB^2d^2n^2(a+bx)}{(bc-ad)^4g^2i^3(c+dx)}-\frac{2b^3B^2n^2(c+dx)}{(bc-ad)^4g^2i^3(a+bx)}-\frac{6bB^2\cdots}{(\cdots}$$

```
[Out] -1/4*B^2*d^3*n^2*(b*x+a)^2/(-a*d+b*c)^4/g^2/i^3/(d*x+c)^2-6*A*b*B*d^2*n*(b*
x+a)/(-a*d+b*c)^4/g^2/i^3/(d*x+c)+6*b*B^2*d^2*n^2*(b*x+a)/(-a*d+b*c)^4/g^2/
i^3/(d*x+c)-2*b^3*B^2*n^2*(d*x+c)/(-a*d+b*c)^4/g^2/i^3/(b*x+a)-6*b*B^2*d^2*
n*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)^4/g^2/i^3/(d*x+c)+1/2*B*d^3*
n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^2/i^3/(d*x+c)^2-
2*b^3*B*n*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^2/i^3/(b*x
+a)-1/2*d^3*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/g^2/i^
3/(d*x+c)^2+3*b*d^2*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/
g^2/i^3/(d*x+c)-b^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/
g^2/i^3/(b*x+a)-b^2*d*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3/B/(-a*d+b*c)^4/g^2/
i^3/n
```

Rubi [A]
time = 0.32, antiderivative size = 562, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.178$, Rules used = {2561, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2i^3(a+bx)(bc-ad)^4}-\frac{2b^3Bn(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{b^2d\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{Bg^2i^3n(bc-ad)^4}-\frac{d^3(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^2i^3(c+dx)^2(bc-ad)^4}+\frac{Bd^3n(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^2i^3(c+dx)^2(bc-ad)^4}+\frac{3bd^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2i^3(c+dx)(bc-ad)^4}-\frac{6AbBd^2n(a+bx)}{g^2i^3(c+dx)(bc-ad)^4}-\frac{2b^3B^2n^2(c+dx)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{B^2d^3n^2(a+bx)^2}{4g^2i^3(c+dx)^2(bc-ad)^4}-\frac{6bB^2d^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g^2i^3(c+dx)(bc-ad)^4}+\frac{6bB^2d^2n^2(a+bx)}{g^2i^3(c+dx)(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i + d*i*x)
^3),x]
```

```
[Out] -1/4*(B^2*d^3*n^2*(a + b*x)^2)/((b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (6*A*b
*B*d^2*n*(a + b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) + (6*b*B^2*d^2*n^2*(a
 + b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (2*b^3*B^2*n^2*(c + d*x))/((b*
c - a*d)^4*g^2*i^3*(a + b*x)) - (6*b*B^2*d^2*n*(a + b*x)*Log[e*((a + b*x)/(
c + d*x))^n])/((b*c - a*d)^4*g^2*i^3*(c + d*x)) + (B*d^3*n*(a + b*x)^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) -
 (2*b^3*B*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^
4*g^2*i^3*(a + b*x)) - (d^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2)/(2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) + (3*b*d^2*(a + b*x)*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*(
c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^2*i^3*(
a + b*x)) - (b^2*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(B*(b*c - a*d)
^4*g^2*i^3*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(207c+207dx)^3(ag+bgx)^2}\,dx=\int\left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)^2}-\frac{b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2956581(bc-ad)^4g^2(a+bx)}+\right.$$

$$=-\frac{(b^3d)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{2956581(bc-ad)^4g^2}+\frac{(b^2d^2)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{2956581(bc-ad)^4g^2}+$$

$$=-\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)}-\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc-ad)^2g^2(c+dx)^2}-$$

$$=-\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)}-\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc-ad)^2g^2(c+dx)^2}-$$

$$=-\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)}-\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc-ad)^2g^2(c+dx)^2}-$$

$$=-\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)}-\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc-ad)^2g^2(c+dx)^2}-$$

$$=-\frac{2b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8869743(bc-ad)^3g^2(a+bx)}+\frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17739486(bc-ad)^2g^2(c+dx)^2}+$$

$$=\frac{b^2B^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2956581(bc-ad)^4g^2}-\frac{2b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8869743(bc-ad)^3g^2(a+bx)}+$$

$$=\frac{b^2B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2956581(bc-ad)^4g^2}+\frac{b^2B^2d\log(a+bx)\log^2\left(e\left(\frac{a+b}{c+d}\right.\right.}{2956581(bc-ad)^4g^2}$$

$$=-\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)}-\frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2}-$$

$$=-\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)}-\frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2}-$$

$$=-\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)}-\frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2}-$$

$$=-\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)}-\frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2}-$$

$$=-\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)}-\frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2}-$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1334 vs. $2(562) = 1124$.
time = 1.20, size = 1334, normalized size = 2.37

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i +
d*i*x)^3),x]
```

```
[Out] -1/4*(4*b^2*B^2*d*n^2*(a + b*x)*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]^3 + 2*
B*n*Log[(a + b*x)/(c + d*x)]^2*(6*a*A*b^2*c^2*d + 2*b^3*B*c^3*n - 6*a^2*b*B
*c*d^2*n + a^3*B*d^3*n + 6*A*b^3*c^2*d*x + 12*a*A*b^2*c*d^2*x + 6*b^3*B*c^2
*d*n*x - 12*a*b^2*B*c*d^2*n*x - 3*a^2*b*B*d^3*n*x + 12*A*b^3*c*d^2*x^2 + 6*
a*A*b^2*d^3*x^2 - 9*a*b^2*B*d^3*n*x^2 + 6*A*b^3*d^3*x^3 - 3*b^3*B*d^3*n*x^3
 + 6*b^2*B*d*(a + b*x)*(c + d*x)^2*Log[e*((a + b*x)/(c + d*x))^n] - 6*b^2*B
*d*n*(a + b*x)*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]) + 4*b^2*(b*c - a*d)*(c
 + d*x)^2*(A^2 + 2*A*B*n + 2*B^2*n^2 + B^2*Log[e*((a + b*x)/(c + d*x))^n]^2
 - 2*B*n*(A + B*n)*Log[(a + b*x)/(c + d*x)] + B^2*n^2*Log[(a + b*x)/(c + d*
x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(A + B*n - B*n*Log[(a + b*x)/(c
+ d*x)])) + 2*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d*x)]*(2*b*d*(a + b*x)*(c
+ d*x)*(4*A - 5*B*n + 4*B*Log[e*((a + b*x)/(c + d*x))^n] - 4*B*n*Log[(a + b
*x)/(c + d*x)]) + d*(b*c - a*d)*(a + b*x)*(2*A - B*n + 2*B*Log[e*((a + b*x)
/(c + d*x))^n] - 2*B*n*Log[(a + b*x)/(c + d*x)]) + 4*b^2*(c + d*x)^2*(A + B
*n + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])) + d*
(b*c - a*d)^2*(a + b*x)*(2*A^2 - 2*A*B*n + B^2*n^2 + 2*B^2*Log[e*((a + b*x)
/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*
Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-2*A + B*n
 + 2*B*n*Log[(a + b*x)/(c + d*x)])) + 6*b^2*d*(a + b*x)*(c + d*x)^2*Log[a +
 b*x]*(2*A^2 - 2*A*B*n + 5*B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2
 + 2*B*n*(-2*A + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c
 + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-2*A + B*n + 2*B*n*Log[(a
+ b*x)/(c + d*x)])) + 2*b*d*(b*c - a*d)*(a + b*x)*(c + d*x)*(4*A^2 - 10*A*B
*n + 11*B^2*n^2 + 4*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-4*A + 5*
B*n)*Log[(a + b*x)/(c + d*x)] + 4*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*
Log[e*((a + b*x)/(c + d*x))^n]*(-4*A + 5*B*n + 4*B*n*Log[(a + b*x)/(c + d*x
)])) - 6*b^2*d*(a + b*x)*(c + d*x)^2*(2*A^2 - 2*A*B*n + 5*B^2*n^2 + 2*B^2*L
og[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*Log[(a + b*x)/(c + d*x
)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))
^n]*(-2*A + B*n + 2*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c + d*x])/((b*c - a*
d)^4*g^2*i^3*(a + b*x)*(c + d*x)^2)
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(bgx+ag\right)^{2}\left(dix+ci\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 4053 vs. 2(530) = 1060.
time = 1.01, size = 4053, normalized size = 7.21

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,
 algorithm="maxima")
```

```
[Out] 1/2*B^2*(6*b^2*d*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c
^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) - 6*b^2*d*log(d*x + c)/((I*b^4*c
^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g
^2) + (6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b
*d^2)*x)/((I*b^4*c^3*d^2 - 3*I*a*b^3*c^2*d^3 + 3*I*a^2*b^2*c*d^4 - I*a^3*b*
d^5)*g^2*x^3 + (2*I*b^4*c^4*d - 5*I*a*b^3*c^3*d^2 + 3*I*a^2*b^2*c^2*d^3 + I
*a^3*b*c*d^4 - I*a^4*d^5)*g^2*x^2 + (I*b^4*c^5 - I*a*b^3*c^4*d - 3*I*a^2*b^
2*c^3*d^2 + 5*I*a^3*b*c^2*d^3 - 2*I*a^4*c*d^4)*g^2*x + (I*a*b^3*c^5 - 3*I*a
^2*b^2*c^4*d + 3*I*a^3*b*c^3*d^2 - I*a^4*c^2*d^3)*g^2))*log((b*x/(d*x + c)
+ a/(d*x + c))^n*e)^2 + A*B*(6*b^2*d*log(b*x + a)/((I*b^4*c^4 - 4*I*a*b^3*c
^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*c*d^3 + I*a^4*d^4)*g^2) - 6*b^2*d*lo
g(d*x + c)/((I*b^4*c^4 - 4*I*a*b^3*c^3*d + 6*I*a^2*b^2*c^2*d^2 - 4*I*a^3*b*
c*d^3 + I*a^4*d^4)*g^2) + (6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2
+ 3*(3*b^2*c*d + a*b*d^2)*x)/((I*b^4*c^3*d^2 - 3*I*a*b^3*c^2*d^3 + 3*I*a^2*
b^2*c*d^4 - I*a^3*b*d^5)*g^2*x^3 + (2*I*b^4*c^4*d - 5*I*a*b^3*c^3*d^2 + 3*I
*a^2*b^2*c^2*d^3 + I*a^3*b*c*d^4 - I*a^4*d^5)*g^2*x^2 + (I*b^4*c^5 - I*a*b^
3*c^4*d - 3*I*a^2*b^2*c^3*d^2 + 5*I*a^3*b*c^2*d^3 - 2*I*a^4*c*d^4)*g^2*x +
(I*a*b^3*c^5 - 3*I*a^2*b^2*c^4*d + 3*I*a^3*b*c^3*d^2 - I*a^4*c^2*d^3)*g^2))
*log((b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/4*((-8*I*b^3*c^3 - 15*I*a*b^2*c
^2*d + 24*I*a^2*b*c*d^2 - I*a^3*d^3 - 4*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2
*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x)*log(b*
x + a)^3 - 4*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^
3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(d*x + c)^3 - 30*(I*b^3*c*d
^2 - I*a*b^2*d^3)*x^2 - 6*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 +
 I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x)*log(b*x + a)^2 - 6*(
I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*
c^2*d + 2*I*a*b^2*c*d^2)*x + 2*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*
d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x)*log(b*x + a))*l
og(d*x + c)^2 - 3*(13*I*b^3*c^2*d - 6*I*a*b^2*c*d^2 - 7*I*a^2*b*d^3)*x - 30
*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^
```

```
3*c^2*d + 2*I*a*b^2*c*d^2)*x)*log(b*x + a) - 6*(-5*I*b^3*d^3*x^3 - 5*I*a*b^
2*c^2*d + 5*(-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + 2*(-I*b^3*d^3*x^3 - I*a*b^
2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*
d^2)*x)*log(b*x + a)^2 + 5*(-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x + 2*(-I*b^3*d
^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d
 - 2*I*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c))*n^2/(a*b^4*c^6*g^2 - 4*a
^2*b^3*c^5*d*g^2 + 6*a^3*b^2*c^4*d^2*g^2 - 4*a^4*b*c^3*d^3*g^2 + a^5*c^2*d^
4*g^2 + (b^5*c^4*d^2*g^2 - 4*a*b^4*c^3*d^3*g^2 + 6*a^2*b^3*c^2*d^4*g^2 - 4*
a^3*b^2*c*d^5*g^2 + a^4*b*d^6*g^2)*x^3 + (2*b^5*c^5*d*g^2 - 7*a*b^4*c^4*d^2
*g^2 + 8*a^2*b^3*c^3*d^3*g^2 - 2*a^3*b^2*c^2*d^4*g^2 - 2*a^4*b*c*d^5*g^2 +
a^5*d^6*g^2)*x^2 + (b^5*c^6*g^2 - 2*a*b^4*c^5*d*g^2 - 2*a^2*b^3*c^4*d^2*g^2
 + 8*a^3*b^2*c^3*d^3*g^2 - 7*a^4*b*c^2*d^4*g^2 + 2*a^5*c*d^5*g^2)*x) + 2*(-
4*I*b^3*c^3 + 15*I*a*b^2*c^2*d - 12*I*a^2*b*c*d^2 + I*a^3*d^3 - 6*(-I*b^3*c
*d^2 + I*a*b^2*d^3)*x^2 - 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d
^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(b*x + a)^2
- 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 +
(-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(d*x + c)^2 - 3*(-I*b^3*c^2*d - 2*I*
a*b^2*c*d^2 + 3*I*a^2*b*d^3)*x - 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*
b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(b*x
+ a) - 6*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2
 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x + 2*(I*b^3*d^3*x^3 + I*a*b^2*c^2*d + (
2*I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 + (I*b^3*c^2*d + 2*I*a*b^2*c*d^2)*x)*log(b
*x + a))*log(d*x + c))*n*log((b*x/(d*x + c) + a/(d*x + c))^n*e)/(a*b^4*c^6*
g^2 - 4*a^2*b^3*c^5*d*g^2 + 6*a^3*b^2*c^4*d^2*g^2 - 4*a^4*b*c^3*d^3*g^2 + a
^5*c^2*d^4*g^2 + (b^5*c^4*d^2*g^2 - 4*a*b^4*c^3*d^3*g^2 + 6*a^2*b^3*c^2*d^4
*g^2 - 4*a^3*b^2*c*d^5*g^2 + a^4*b*d^6*g^2)*x^3 + (2*b^5*c^5*d*g^2 - 7*a*b^
4*c^4*d^2*g^2 + 8*a^2*b^3*c^3*d^3*g^2 - 2*a^3*b^2*c^2*d^4*g^2 - 2*a^4*b*c*d
^5*g^2 + a^5*d^6*g^2)*x^2 + (b^5*c^6*g^2 - 2*a*b^4*c^5*d*g^2 - 2*a^2*b^3*c^
4*d^2*g^2 + 8*a^3*b^2*c^3*d^3*g^2 - 7*a^4*b*c^2*d^4*g^2 + 2*a^5*c*d^5*g^2)*
x))*B^2 + 1/2*(-4*I*b^3*c^3 + 15*I*a*b^2*c^2*d - 12*I*a^2*b*c*d^2 + I*a^3*d
^3 - 6*(-I*b^3*c*d^2 + I*a*b^2*d^3)*x^2 - 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d
 + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)
*log(b*x + a)^2 - 6*(-I*b^3*d^3*x^3 - I*a*b^2*c^2*d + (-2*I*b^3*c*d^2 - I*a
*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*d^2)*x)*log(d*x + c)^2 - 3*(-I*
b^3*c^2*d - 2*I*a*b^2*c*d^2 + 3*I*a^2*b*d^3)*x - 6*(-I*b^3*d^3*x^3 - I*a*b^
2*c^2*d + (-2*I*b^3*c*d^2 - I*a*b^2*d^3)*x^2 + (-I*b^3*c^2*d - 2*I*a*b^2*c*
d^2)*x)*log(b*x + a) - 6*(I*b^3*d^3*x^3 + I*a*b...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1656 vs. $2(530) = 1060$.
time = 0.45, size = 1656, normalized size = 2.95

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] -1/4*(4*(I*A^2 + 2*I*A*B + I*B^2)*b^3*c^3 + 6*(I*A^2 + 2*I*A*B + I*B^2)*a*b
^2*c^2*d + 12*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b*c*d^2 + 2*(I*A^2 + 2*I*A*B +
 I*B^2)*a^3*d^3 + 4*(I*B^2*b^3*d^3*n^2*x^3 + I*B^2*a*b^2*c^2*d*n^2 + (2*I*B
^2*b^3*c*d^2 + I*B^2*a*b^2*d^3)*n^2*x^2 + (I*B^2*b^3*c^2*d + 2*I*B^2*a*b^2*
c*d^2)*n^2*x)*log((b*x + a)/(d*x + c))^3 - (-8*I*B^2*b^3*c^3 - 15*I*B^2*a*b
^2*c^2*d + 24*I*B^2*a^2*b*c*d^2 - I*B^2*a^3*d^3)*n^2 + 6*(2*(I*A^2 + 2*I*A*
B + I*B^2)*b^3*c*d^2 + 2*(-I*A^2 - 2*I*A*B - I*B^2)*a*b^2*d^3 + 5*(I*B^2*b^
3*c*d^2 - I*B^2*a*b^2*d^3)*n^2 + 2*((-I*A*B - I*B^2)*b^3*c*d^2 + (I*A*B + I
*B^2)*a*b^2*d^3)*n)*x^2 + 2*(6*(I*A*B + I*B^2)*a*b^2*c^2*d*n + 3*(-I*B^2*b^
3*d^3*n^2 + 2*(I*A*B + I*B^2)*b^3*d^3*n)*x^3 + (2*I*B^2*b^3*c^3 - 6*I*B^2*a
^2*b*c*d^2 + I*B^2*a^3*d^3)*n^2 + 3*(-3*I*B^2*a*b^2*d^3*n^2 + 2*(2*(I*A*B +
 I*B^2)*b^3*c*d^2 + (I*A*B + I*B^2)*a*b^2*d^3)*n)*x^2 + 3*((2*I*B^2*b^3*c^2
*d - 4*I*B^2*a*b^2*c*d^2 - I*B^2*a^2*b*d^3)*n^2 + 2*((I*A*B + I*B^2)*b^3*c^
2*d + 2*(I*A*B + I*B^2)*a*b^2*c*d^2)*n)*x)*log((b*x + a)/(d*x + c))^2 + 2*(
4*(I*A*B + I*B^2)*b^3*c^3 + 15*(-I*A*B - I*B^2)*a*b^2*c^2*d + 12*(I*A*B + I
*B^2)*a^2*b*c*d^2 + (-I*A*B - I*B^2)*a^3*d^3)*n + 3*(6*(I*A^2 + 2*I*A*B + I
*B^2)*b^3*c^2*d + 4*(-I*A^2 - 2*I*A*B - I*B^2)*a*b^2*c*d^2 + 2*(-I*A^2 - 2*
I*A*B - I*B^2)*a^2*b*d^3 + (13*I*B^2*b^3*c^2*d - 6*I*B^2*a*b^2*c*d^2 - 7*I*
B^2*a^2*b*d^3)*n^2 + 2*((-I*A*B - I*B^2)*b^3*c^2*d + 2*(-I*A*B - I*B^2)*a*b
^2*c*d^2 + 3*(I*A*B + I*B^2)*a^2*b*d^3)*n)*x + 2*(6*(I*A^2 + 2*I*A*B + I*B^
2)*a*b^2*c^2*d + 3*(5*I*B^2*b^3*d^3*n^2 + 2*(-I*A*B - I*B^2)*b^3*d^3*n + 2*
(I*A^2 + 2*I*A*B + I*B^2)*b^3*d^3)*x^3 + (4*I*B^2*b^3*c^3 + 12*I*B^2*a^2*b*
c*d^2 - I*B^2*a^3*d^3)*n^2 + 3*(6*(-I*A*B - I*B^2)*a*b^2*d^3*n + 4*(I*A^2 +
 2*I*A*B + I*B^2)*b^3*c*d^2 + 2*(I*A^2 + 2*I*A*B + I*B^2)*a*b^2*d^3 + (8*I*
B^2*b^3*c*d^2 + 7*I*B^2*a*b^2*d^3)*n^2)*x^2 + 2*(2*(I*A*B + I*B^2)*b^3*c^3
+ 6*(-I*A*B - I*B^2)*a^2*b*c*d^2 + (I*A*B + I*B^2)*a^3*d^3)*n + 3*(2*(I*A^2
 + 2*I*A*B + I*B^2)*b^3*c^2*d + 4*(I*A^2 + 2*I*A*B + I*B^2)*a*b^2*c*d^2 + (
4*I*B^2*b^3*c^2*d + 8*I*B^2*a*b^2*c*d^2 + 3*I*B^2*a^2*b*d^3)*n^2 + 2*(2*(I*
A*B + I*B^2)*b^3*c^2*d + 4*(-I*A*B - I*B^2)*a*b^2*c*d^2 + (-I*A*B - I*B^2)*
a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))/((b^5*c^4*d^2 - 4*a*b^4*c^3*d^3
+ 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c*d^5 + a^4*b*d^6)*g^2*x^3 + (2*b^5*c^5*d -
 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3 - 2*a^3*b^2*c^2*d^4 - 2*a^4*b*c*d^5 +
a^5*d^6)*g^2*x^2 + (b^5*c^6 - 2*a*b^4*c^5*d - 2*a^2*b^3*c^4*d^2 + 8*a^3*b^2
*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^5)*g^2*x + (a*b^4*c^6 - 4*a^2*b^3*c^
5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d^3 + a^5*c^2*d^4)*g^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/((b*g*x + a*g)^2*(I*d*x
+ I*c)^3), x)
```

Mupad [B]
time = 10.14, size = 1785, normalized size = 3.18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^2*(c*i + d*i*x)
^3),x)
```

```
[Out] ((4*A^2*b^2*c^2 - 2*A^2*a^2*d^2 - B^2*a^2*d^2*n^2 + 8*B^2*b^2*c^2*n^2 + 10*
A^2*a*b*c*d + 2*A*B*a^2*d^2*n + 8*A*B*b^2*c^2*n + 23*B^2*a*b*c*d*n^2 - 22*A
*B*a*b*c*d*n)/(2*(a*d - b*c)) + (3*x^2*(2*A^2*b^2*d^2 + 5*B^2*b^2*d^2*n^2 -
 2*A*B*b^2*d^2*n))/(a*d - b*c) + (3*x*(2*A^2*a*b*d^2 + 6*A^2*b^2*c*d + 7*B^
2*a*b*d^2*n^2 + 13*B^2*b^2*c*d*n^2 - 6*A*B*a*b*d^2*n - 2*A*B*b^2*c*d*n))/(2
*(a*d - b*c)))/(x*(2*b^3*c^4*g^2*i^3 + 4*a^3*c*d^3*g^2*i^3 - 6*a^2*b*c^2*d^
2*g^2*i^3) + x^2*(2*a^3*d^4*g^2*i^3 + 4*b^3*c^3*d*g^2*i^3 - 6*a*b^2*c^2*d^2
*g^2*i^3) + x^3*(2*b^3*c^2*d^2*g^2*i^3 + 2*a^2*b*d^4*g^2*i^3 - 4*a*b^2*c*d^
3*g^2*i^3) + 2*a^3*c^2*d^2*g^2*i^3 + 2*a*b^2*c^4*g^2*i^3 - 4*a^2*b*c^3*d*g^
2*i^3) - log(e*((a + b*x)/(c + d*x))^n)^2*(((B^2*(a*d + 2*b*c))/(2*(a^2*d^2
 + b^2*c^2 - 2*a*b*c*d)) + (3*B^2*b*d*x)/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)
))/(x*(b*c^2*g^2*i^3 + 2*a*c*d*g^2*i^3) + x^2*(a*d^2*g^2*i^3 + 2*b*c*d*g^2*
i^3) + a*c^2*g^2*i^3 + b*d^2*g^2*i^3*x^3) + (3*B*b^2*d*(2*A - B*n))/(2*g^2*
i^3*n*(a*d - b*c)^4) - (3*B^2*b^2*d*(d*g^2*i^3*n*x^2*(a*d - b*c) + (a*c*g^2
*i^3*n*(a*d - b*c))/b + (g^2*i^3*n*x*(a*d + b*c)*(a*d - b*c))/b))/(g^2*i^3*
n*(a*d - b*c)^4*(x*(b*c^2*g^2*i^3 + 2*a*c*d*g^2*i^3) + x^2*(a*d^2*g^2*i^3 +
 2*b*c*d*g^2*i^3) + a*c^2*g^2*i^3 + b*d^2*g^2*i^3*x^3))) - log(e*((a + b*x)
/(c + d*x))^n)*((x*((3*B^2*b*d*n)/2 + 3*A*B*b*d) - (B^2*a*d*n)/2 + 2*B^2*b*
c*n + A*B*a*d + 2*A*B*b*c)/(x*(b^3*c^4*g^2*i^3 + 2*a^3*c*d^3*g^2*i^3 - 3*a^
2*b*c^2*d^2*g^2*i^3) + x^2*(a^3*d^4*g^2*i^3 + 2*b^3*c^3*d*g^2*i^3 - 3*a*b^2
```

```
*c^2*d^2*g^2*i^3) + x^3*(b^3*c^2*d^2*g^2*i^3 + a^2*b*d^4*g^2*i^3 - 2*a*b^2*
c*d^3*g^2*i^3) + a^3*c^2*d^2*g^2*i^3 + a*b^2*c^4*g^2*i^3 - 2*a^2*b*c^3*d*g^
2*i^3) - (3*B*b^2*d*(2*A - B*n)*(d*g^2*i^3*n*x^2*(a*d - b*c)^3 + (g^2*i^3*n
*x*(a*d + b*c)*(a*d - b*c)^3)/b + (a*c*g^2*i^3*n*(a*d - b*c)^3)/b))/(g^2*i^
3*n*(a*d - b*c)^4*(x*(b^3*c^4*g^2*i^3 + 2*a^3*c*d^3*g^2*i^3 - 3*a^2*b*c^2*d
^2*g^2*i^3) + x^2*(a^3*d^4*g^2*i^3 + 2*b^3*c^3*d*g^2*i^3 - 3*a*b^2*c^2*d^2*
g^2*i^3) + x^3*(b^3*c^2*d^2*g^2*i^3 + a^2*b*d^4*g^2*i^3 - 2*a*b^2*c*d^3*g^2
*i^3) + a^3*c^2*d^2*g^2*i^3 + a*b^2*c^4*g^2*i^3 - 2*a^2*b*c^3*d*g^2*i^3)))
+ (b^2*d*atan((b^2*d*(2*A^2 + 5*B^2*n^2 - 2*A*B*n)*(2*a^4*d^4*g^2*i^3 - 2*b
^4*c^4*g^2*i^3 + 4*a*b^3*c^3*d*g^2*i^3 - 4*a^3*b*c*d^3*g^2*i^3)*3i)/(2*g^2*
i^3*(a*d - b*c)^4*(6*A^2*b^2*d + 15*B^2*b^2*d*n^2 - 6*A*B*b^2*d*n)) + (b^3*
d^2*x*(2*A^2 + 5*B^2*n^2 - 2*A*B*n)*(a^3*d^3*g^2*i^3 - b^3*c^3*g^2*i^3 + 3*
a*b^2*c^2*d*g^2*i^3 - 3*a^2*b*c*d^2*g^2*i^3)*6i)/(g^2*i^3*(a*d - b*c)^4*(6*
A^2*b^2*d + 15*B^2*b^2*d*n^2 - 6*A*B*b^2*d*n)))*(2*A^2 + 5*B^2*n^2 - 2*A*B*
n)*3i)/(g^2*i^3*(a*d - b*c)^4) - (B^2*b^2*d*log(e*((a + b*x)/(c + d*x))^n)^
3)/(g^2*i^3*n*(a*d - b*c)^4)
```

3.208 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)^3}\,dx$

Optimal. Leaf size=732

$$\frac{B^2d^4n^2(a+bx)^2}{4(bc-ad)^5g^3i^3(c+dx)^2}+\frac{8AbBd^3n(a+bx)}{(bc-ad)^5g^3i^3(c+dx)}-\frac{8bB^2d^3n^2(a+bx)}{(bc-ad)^5g^3i^3(c+dx)}+\frac{8b^3B^2dn^2(c+dx)}{(bc-ad)^5g^3i^3(a+bx)}-\frac{b^4B}{4(bc-}$$

```
[Out] 1/4*B^2*d^4*n^2*(b*x+a)^2/(-a*d+b*c)^5/g^3/i^3/(d*x+c)^2+8*A*b*B*d^3*n*(b*x
+a)/(-a*d+b*c)^5/g^3/i^3/(d*x+c)-8*b*B^2*d^3*n^2*(b*x+a)/(-a*d+b*c)^5/g^3/i
^3/(d*x+c)+8*b^3*B^2*d*n^2*(d*x+c)/(-a*d+b*c)^5/g^3/i^3/(b*x+a)-1/4*b^4*B^2
*n^2*(d*x+c)^2/(-a*d+b*c)^5/g^3/i^3/(b*x+a)^2+8*b*B^2*d^3*n*(b*x+a)*ln(e*((
b*x+a)/(d*x+c))^n)/(-a*d+b*c)^5/g^3/i^3/(d*x+c)-1/2*B*d^4*n*(b*x+a)^2*(A+B*
ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^3/i^3/(d*x+c)^2+8*b^3*B*d*n*(d*x+
c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^3/i^3/(b*x+a)-1/2*b^4*B*n
*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^5/g^3/i^3/(b*x+a)^2+1
/2*d^4*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^5/g^3/i^3/(d*
x+c)^2-4*b*d^3*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^5/g^3/i
^3/(d*x+c)+4*b^3*d*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^5/g
^3/i^3/(b*x+a)-1/2*b^4*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*
c)^5/g^3/i^3/(b*x+a)^2+2*b^2*d^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3/B/(-a*d+
b*c)^5/g^3/i^3/n
```

Rubi [A]
time = 0.38, antiderivative size = 732, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.178$, Rules used = {2561, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{b^4(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3i^3(a+bx)^2(bc-ad)^5}-\frac{b^4Bn(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b^3d(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^3i^3(a+bx)(bc-ad)^5}+\frac{8b^3Bdn(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^3(a+bx)(bc-ad)^5}+\frac{2b^2d^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{Bg^3i^3n(bc-ad)^5}+\frac{d^4(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3i^3(c+dx)^2(bc-ad)^5}-\frac{Bd^4n(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^3(c+dx)^2(bc-ad)^5}-\frac{4bd^3(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^3i^3(c+dx)(bc-ad)^5}+\frac{8AbBd^3n(a+bx)}{g^3i^3(c+dx)(bc-ad)^5}-\frac{b^4B^2n^2(c+dx)^2}{4g^3i^3(a+bx)^2(bc-ad)^5}+\frac{8b^3B^2dn^2(c+dx)}{g^3i^3(a+bx)(bc-ad)^5}+\frac{B^2d^4n^2(a+bx)^2}{4g^3i^3(c+dx)^2(bc-ad)^5}+\frac{8bB^2d^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g^3i^3(c+dx)(bc-ad)^5}-\frac{8bB^2d^3n^2(a+bx)}{g^3i^3(c+dx)(bc-ad)^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i + d*i*x)
^3),x]
```

```
[Out] (B^2*d^4*n^2*(a + b*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*A*b*B*
d^3*n*(a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) - (8*b*B^2*d^3*n^2*(a +
b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (8*b^3*B^2*d*n^2*(c + d*x))/((b*c
 - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B^2*n^2*(c + d*x)^2)/(4*(b*c - a*d)^5*g
^3*i^3*(a + b*x)^2) + (8*b*B^2*d^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^
n])/((b*c - a*d)^5*g^3*i^3*(c + d*x)) - (B*d^4*n*(a + b*x)^2*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*b^3*B*
d*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^3*i^
3*(a + b*x)) - (b^4*B*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2) + (d^4*(a + b*x)^2*(A + B*Log[e*((a
```

```
+ b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(
a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^3*i^3*(
c + d*x)) + (4*b^3*d*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((
b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2)/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2) + (2*b^2*d^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])^3)/(B*(b*c - a*d)^5*g^3*i^3*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
```

```
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(208c+208dx)^3(ag+bgx)^3}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^3g^3(a+bx)^3} - \frac{3b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)^2} +\right.$$

$$= \frac{(3b^3d^2)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{4499456(bc-ad)^5g^3} - \frac{(3b^2d^3)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{4499456(bc-ad)^5g^3} -$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8998912(bc-ad)^4g^3(a+bx)} -$$

$$= -\frac{3b^2B^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4499456(bc-ad)^5g^3} - \frac{b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17997824(bc-ad)^3g^3(a+bx}$$

$$= -\frac{3b^2B^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4499456(bc-ad)^5g^3} - \frac{3b^2B^2d^2\log(a+bx)\log^2}{4499456(bc-ad)}$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} +$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} +$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1653 vs. $2(732) = 1464$.
time = 1.53, size = 1653, normalized size = 2.26

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i +
d*i*x)^3),x]
```

```
[Out] (8*b^2*B^2*d^2*n^2*(a + b*x)^2*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]^3 + 2*B
*n*Log[(a + b*x)/(c + d*x)]^2*(12*a^2*A*b^2*c^2*d^2 - b^4*B*c^4*n + 8*a*b^3
*B*c^3*d*n - 8*a^3*b*B*c*d^3*n + a^4*B*d^4*n + 24*a*A*b^3*c^2*d^2*x + 24*a^
2*A*b^2*c*d^3*x + 4*b^4*B*c^3*d*n*x + 24*a*b^3*B*c^2*d^2*n*x - 24*a^2*b^2*B
*c*d^3*n*x - 4*a^3*b*B*d^4*n*x + 12*A*b^4*c^2*d^2*x^2 + 48*a*A*b^3*c*d^3*x^
2 + 12*a^2*A*b^2*d^4*x^2 + 18*b^4*B*c^2*d^2*n*x^2 - 18*a^2*b^2*B*d^4*n*x^2
+ 24*A*b^4*c*d^3*x^3 + 24*a*A*b^3*d^4*x^3 + 12*b^4*B*c*d^3*n*x^3 - 12*a*b^3
*B*d^4*n*x^3 + 12*A*b^4*d^4*x^4 + 12*b^2*B*d^2*(a + b*x)^2*(c + d*x)^2*Log[
e*((a + b*x)/(c + d*x))^n] - 12*b^2*B*d^2*n*(a + b*x)^2*(c + d*x)^2*Log[(a
+ b*x)/(c + d*x)]) + 12*b^2*d^2*(a + b*x)^2*(c + d*x)^2*Log[a + b*x]*(2*A^2
 + 5*B^2*n^2 + 4*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c +
 d*x)]) + 2*B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)
])^2) + 2*b^2*d*(b*c - a*d)*(a + b*x)*(c + d*x)^2*(6*A^2 + 14*A*B*n + 15*B^
2*n^2 + 6*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(6*A + 7*B*n)*Log[(a
 + b*x)/(c + d*x)] + 6*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a +
 b*x)/(c + d*x))^n]*(6*A + 7*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) - b^2*(
b*c - a*d)^2*(c + d*x)^2*(2*A^2 + 2*A*B*n + B^2*n^2 + 2*B^2*Log[e*((a + b*x
)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*
Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A + B*n
- 2*B*n*Log[(a + b*x)/(c + d*x)])) + 2*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d
*x)]*(2*b*d^2*(a + b*x)^2*(c + d*x)*(6*A - 7*B*n + 6*B*Log[e*((a + b*x)/(c
+ d*x))^n] - 6*B*n*Log[(a + b*x)/(c + d*x)]) + 2*b^2*d*(a + b*x)*(c + d*x)^
2*(6*A + 7*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n] - 6*B*n*Log[(a + b*x)/(
c + d*x)]) + d^2*(b*c - a*d)*(a + b*x)^2*(2*A - B*n + 2*B*Log[e*((a + b*x)/
(c + d*x))^n] - 2*B*n*Log[(a + b*x)/(c + d*x)]) - b^2*(b*c - a*d)*(c + d*x)
^2*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n] - 2*B*n*Log[(a + b*x)/(c
 + d*x)])) + d^2*(b*c - a*d)^2*(a + b*x)^2*(2*A^2 - 2*A*B*n + B^2*n^2 + 2*B
^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*Log[(a + b*x)/(c +
 d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d
*x))^n]*(-2*A + B*n + 2*B*n*Log[(a + b*x)/(c + d*x)])) + 2*b*d^2*(b*c - a*d
)*(a + b*x)^2*(c + d*x)*(6*A^2 - 14*A*B*n + 15*B^2*n^2 + 6*B^2*Log[e*((a +
b*x)/(c + d*x))^n]^2 + 2*B*n*(-6*A + 7*B*n)*Log[(a + b*x)/(c + d*x)] + 6*B^
2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-6*A
 + 7*B*n + 6*B*n*Log[(a + b*x)/(c + d*x)])) - 12*b^2*d^2*(a + b*x)^2*(c + d
*x)^2*(2*A^2 + 5*B^2*n^2 + 4*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a
```

```
 + b*x)/(c + d*x)]) + 2*B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*
x)/(c + d*x)])^2)*Log[c + d*x])/(4*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2*(c + d
*x)^2)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(bgx+ag\right)^{3}\left(dix+ci\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5391 vs. 2(687) = 1374.
time = 1.21, size = 5391, normalized size = 7.36

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x,
 algorithm="maxima")
```

```
[Out] 1/2*B^2*(12*b^2*d^2*log(b*x + a)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*
b^3*c^3*d^2 + 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) - 12
*b^2*d^2*log(d*x + c)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2
 + 10*I*a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) + (12*b^3*d^3*x
^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*
b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((-I*b^6*c^4*d^
2 + 4*I*a*b^5*c^3*d^3 - 6*I*a^2*b^4*c^2*d^4 + 4*I*a^3*b^3*c*d^5 - I*a^4*b^2
*d^6)*g^3*x^4 + 2*(-I*b^6*c^5*d + 3*I*a*b^5*c^4*d^2 - 2*I*a^2*b^4*c^3*d^3 -
 2*I*a^3*b^3*c^2*d^4 + 3*I*a^4*b^2*c*d^5 - I*a^5*b*d^6)*g^3*x^3 + (-I*b^6*c
^6 + 9*I*a^2*b^4*c^4*d^2 - 16*I*a^3*b^3*c^3*d^3 + 9*I*a^4*b^2*c^2*d^4 - I*a
^6*d^6)*g^3*x^2 + 2*(-I*a*b^5*c^6 + 3*I*a^2*b^4*c^5*d - 2*I*a^3*b^3*c^4*d^2
 - 2*I*a^4*b^2*c^3*d^3 + 3*I*a^5*b*c^2*d^4 - I*a^6*c*d^5)*g^3*x + (-I*a^2*b
^4*c^6 + 4*I*a^3*b^3*c^5*d - 6*I*a^4*b^2*c^4*d^2 + 4*I*a^5*b*c^3*d^3 - I*a^
6*c^2*d^4)*g^3))*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2 + A*B*(12*b^2*d^2
*log(b*x + a)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 + 10*I*
a^3*b^2*c^2*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) - 12*b^2*d^2*log(d*x +
c)/((-I*b^5*c^5 + 5*I*a*b^4*c^4*d - 10*I*a^2*b^3*c^3*d^2 + 10*I*a^3*b^2*c^2
*d^3 - 5*I*a^4*b*c*d^4 + I*a^5*d^5)*g^3) + (12*b^3*d^3*x^3 - b^3*c^3 + 7*a*
b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b
^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((-I*b^6*c^4*d^2 + 4*I*a*b^5*c^3*d
```

^3 - 6*I*a^2*b^4*c^2*d^4 + 4*I*a^3*b^3*c*d^5 - I*a^4*b^2*d^6)*g^3*x^4 + 2*(
-I*b^6*c^5*d + 3*I*a*b^5*c^4*d^2 - 2*I*a^2*b^4*c^3*d^3 - 2*I*a^3*b^3*c^2*d^
4 + 3*I*a^4*b^2*c*d^5 - I*a^5*b*d^6)*g^3*x^3 + (-I*b^6*c^6 + 9*I*a^2*b^4*c^
4*d^2 - 16*I*a^3*b^3*c^3*d^3 + 9*I*a^4*b^2*c^2*d^4 - I*a^6*d^6)*g^3*x^2 + 2
*(-I*a*b^5*c^6 + 3*I*a^2*b^4*c^5*d - 2*I*a^3*b^3*c^4*d^2 - 2*I*a^4*b^2*c^3*
d^3 + 3*I*a^5*b*c^2*d^4 - I*a^6*c*d^5)*g^3*x + (-I*a^2*b^4*c^6 + 4*I*a^3*b^
3*c^5*d - 6*I*a^4*b^2*c^4*d^2 + 4*I*a^5*b*c^3*d^3 - I*a^6*c^2*d^4)*g^3))*lo
g((b*x/(d*x + c) + a/(d*x + c))^n*e) - 1/4*((I*b^4*c^4 - 32*I*a*b^3*c^3*d +
32*I*a^3*b*c*d^3 - I*a^4*d^4 - 60*(I*b^4*c*d^3 - I*a*b^3*d^4)*x^3 - 8*(I*b
^4*d^4*x^4 + I*a^2*b^2*c^2*d^2 + 2*(I*b^4*c*d^3 + I*a*b^3*d^4)*x^3 + (I*b^4
*c^2*d^2 + 4*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)*x^2 + 2*(I*a*b^3*c^2*d^2 + I*a^
2*b^2*c*d^3)*x)*log(b*x + a)^3 - 24*(I*b^4*d^4*x^4 + I*a^2*b^2*c^2*d^2 + 2*
(I*b^4*c*d^3 + I*a*b^3*d^4)*x^3 + (I*b^4*c^2*d^2 + 4*I*a*b^3*c*d^3 + I*a^2*
b^2*d^4)*x^2 + 2*(I*a*b^3*c^2*d^2 + I*a^2*b^2*c*d^3)*x)*log(b*x + a)*log(d*
x + c)^2 - 8*(-I*b^4*d^4*x^4 - I*a^2*b^2*c^2*d^2 + 2*(-I*b^4*c*d^3 - I*a*b^
3*d^4)*x^3 + (-I*b^4*c^2*d^2 - 4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 + 2*(-I
*a*b^3*c^2*d^2 - I*a^2*b^2*c*d^3)*x)*log(d*x + c)^3 - 90*(I*b^4*c^2*d^2 - I
*a^2*b^2*d^4)*x^2 - 4*(7*I*b^4*c^3*d + 24*I*a*b^3*c^2*d^2 - 24*I*a^2*b^2*c*
d^3 - 7*I*a^3*b*d^4)*x - 60*(I*b^4*d^4*x^4 + I*a^2*b^2*c^2*d^2 + 2*(I*b^4*c
*d^3 + I*a*b^3*d^4)*x^3 + (I*b^4*c^2*d^2 + 4*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)
x^2 + 2(I*a*b^3*c^2*d^2 + I*a^2*b^2*c*d^3)*x)*log(b*x + a) - 12*(-5*I*b^4
*d^4*x^4 - 5*I*a^2*b^2*c^2*d^2 + 10*(-I*b^4*c*d^3 - I*a*b^3*d^4)*x^3 + 5*(-
I*b^4*c^2*d^2 - 4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 + 2*(-I*b^4*d^4*x^4 -
I*a^2*b^2*c^2*d^2 + 2*(-I*b^4*c*d^3 - I*a*b^3*d^4)*x^3 + (-I*b^4*c^2*d^2 -
4*I*a*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 + 2*(-I*a*b^3*c^2*d^2 - I*a^2*b^2*c*d^
3)*x)*log(b*x + a)^2 + 10*(-I*a*b^3*c^2*d^2 - I*a^2*b^2*c*d^3)*x)*log(d*x +
c))*n^2/(a^2*b^5*c^7*g^3 - 5*a^3*b^4*c^6*d*g^3 + 10*a^4*b^3*c^5*d^2*g^3 -
10*a^5*b^2*c^4*d^3*g^3 + 5*a^6*b*c^3*d^4*g^3 - a^7*c^2*d^5*g^3 + (b^7*c^5*d
^2*g^3 - 5*a*b^6*c^4*d^3*g^3 + 10*a^2*b^5*c^3*d^4*g^3 - 10*a^3*b^4*c^2*d^5*
g^3 + 5*a^4*b^3*c*d^6*g^3 - a^5*b^2*d^7*g^3)*x^4 + 2*(b^7*c^6*d*g^3 - 4*a*b
^6*c^5*d^2*g^3 + 5*a^2*b^5*c^4*d^3*g^3 - 5*a^4*b^3*c^2*d^5*g^3 + 4*a^5*b^2*
c*d^6*g^3 - a^6*b*d^7*g^3)*x^3 + (b^7*c^7*g^3 - a*b^6*c^6*d*g^3 - 9*a^2*b^5
*c^5*d^2*g^3 + 25*a^3*b^4*c^4*d^3*g^3 - 25*a^4*b^3*c^3*d^4*g^3 + 9*a^5*b^2*
c^2*d^5*g^3 + a^6*b*c*d^6*g^3 - a^7*d^7*g^3)*x^2 + 2*(a*b^6*c^7*g^3 - 4*a^2
*b^5*c^6*d*g^3 + 5*a^3*b^4*c^5*d^2*g^3 - 5*a^5*b^2*c^3*d^4*g^3 + 4*a^6*b*c^
2*d^5*g^3 - a^7*c*d^6*g^3)*x) + 2*(I*b^4*c^4 - 16*I*a*b^3*c^3*d + 30*I*a^2*
b^2*c^2*d^2 - 16*I*a^3*b*c*d^3 + I*a^4*d^4 - 12*(I*b^4*c^2*d^2 - 2*I*a*b^3*
c*d^3 + I*a^2*b^2*d^4)*x^2 - 12*(-I*b^4*d^4*x^4 - I*a^2*b^2*c^2*d^2 + 2*(-I
*b^4*c*d^3 - I*a*b^3*d^4)*x^3 + (-I*b^4*c^2*d^2 - 4*I*a*b^3*c*d^3 - I*a^2*b
^2*d^4)*x^2 + 2*(-I*a*b^3*c^2*d^2 - I*a^2*b^2*c*d^3)*x)*log(b*x + a)^2 - 24
*(I*b^4*d^4*x^4 + I*a^2*b^2*c^2*d^2 + 2*(I*b^4*c*d^3 + I*a*b^3*d^4)*x^3 + (
I*b^4*c^2*d^2 + 4*I*a*b^3*c*d^3 + I*a^2*b^2*d^4)*x^2 + 2*(I*a*b^3*c^2*d^2 +
I*a^2*b^2*c*d^3)*x)*log(b*x + a)*log(d*x + c) - 12*(-I*b^4*d^4*x^4 - I*a^2
*b^2*c^2*d^2 + 2*(-I*b^4*c*d^3 - I*a*b^3*d^4)*x^3 + (-I*b^4*c^2*d^2 - 4*I*a
*b^3*c*d^3 - I*a^2*b^2*d^4)*x^2 + 2*(-I*a*b^3*c^2*d^2 - I*a^2*b^2*c*d^3)*x)

```
*log(d*x + c)^2 - 12*(I*b^4*c^3*d - I*a*b^3*c^2*d^2 - I*a^2*b^2*c*d^3 + I*a
^3*b*d^4)*x)*n*log((b*x/(d*x + c) + a/(d*x + c)...
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2457 vs. $2(687) = 1374$.
time = 0.47, size = 2457, normalized size = 3.36

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] 1/4*(2*(-I*A^2 - 2*I*A*B - I*B^2)*b^4*c^4 + 16*(I*A^2 + 2*I*A*B + I*B^2)*a*
b^3*c^3*d + 16*(-I*A^2 - 2*I*A*B - I*B^2)*a^3*b*c*d^3 + 2*(I*A^2 + 2*I*A*B
+ I*B^2)*a^4*d^4 + 12*(2*(I*A^2 + 2*I*A*B + I*B^2)*b^4*c*d^3 + 2*(-I*A^2 -
2*I*A*B - I*B^2)*a*b^3*d^4 + 5*(I*B^2*b^4*c*d^3 - I*B^2*a*b^3*d^4)*n^2)*x^3
 + 8*(I*B^2*b^4*d^4*n^2*x^4 + I*B^2*a^2*b^2*c^2*d^2*n^2 + 2*(I*B^2*b^4*c*d^
3 + I*B^2*a*b^3*d^4)*n^2*x^3 + (I*B^2*b^4*c^2*d^2 + 4*I*B^2*a*b^3*c*d^3 + I
*B^2*a^2*b^2*d^4)*n^2*x^2 + 2*(I*B^2*a*b^3*c^2*d^2 + I*B^2*a^2*b^2*c*d^3)*n
^2*x)*log((b*x + a)/(d*x + c))^3 - (I*B^2*b^4*c^4 - 32*I*B^2*a*b^3*c^3*d +
32*I*B^2*a^3*b*c*d^3 - I*B^2*a^4*d^4)*n^2 + 6*(6*(I*A^2 + 2*I*A*B + I*B^2)*
b^4*c^2*d^2 + 6*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b^2*d^4 + 15*(I*B^2*b^4*c^2*
d^2 - I*B^2*a^2*b^2*d^4)*n^2 + 4*((I*A*B + I*B^2)*b^4*c^2*d^2 + 2*(-I*A*B -
 I*B^2)*a*b^3*c*d^3 + (I*A*B + I*B^2)*a^2*b^2*d^4)*n)*x^2 + 2*(12*(I*A*B +
I*B^2)*b^4*d^4*n*x^4 + 12*(I*A*B + I*B^2)*a^2*b^2*c^2*d^2*n + 12*((I*B^2*b^
4*c*d^3 - I*B^2*a*b^3*d^4)*n^2 + 2*((I*A*B + I*B^2)*b^4*c*d^3 + (I*A*B + I*
B^2)*a*b^3*d^4)*n)*x^3 + (-I*B^2*b^4*c^4 + 8*I*B^2*a*b^3*c^3*d - 8*I*B^2*a^
3*b*c*d^3 + I*B^2*a^4*d^4)*n^2 + 6*(3*(I*B^2*b^4*c^2*d^2 - I*B^2*a^2*b^2*d^
4)*n^2 + 2*((I*A*B + I*B^2)*b^4*c^2*d^2 + 4*(I*A*B + I*B^2)*a*b^3*c*d^3 + (
I*A*B + I*B^2)*a^2*b^2*d^4)*n)*x^2 + 4*((I*B^2*b^4*c^3*d + 6*I*B^2*a*b^3*c^
2*d^2 - 6*I*B^2*a^2*b^2*c*d^3 - I*B^2*a^3*b*d^4)*n^2 + 6*((I*A*B + I*B^2)*a
*b^3*c^2*d^2 + (I*A*B + I*B^2)*a^2*b^2*c*d^3)*n)*x)*log((b*x + a)/(d*x + c)
)^2 + 2*((-I*A*B - I*B^2)*b^4*c^4 + 16*(I*A*B + I*B^2)*a*b^3*c^3*d + 30*(-I
*A*B - I*B^2)*a^2*b^2*c^2*d^2 + 16*(I*A*B + I*B^2)*a^3*b*c*d^3 + (-I*A*B -
I*B^2)*a^4*d^4)*n + 4*(2*(I*A^2 + 2*I*A*B + I*B^2)*b^4*c^3*d + 12*(I*A^2 +
2*I*A*B + I*B^2)*a*b^3*c^2*d^2 + 12*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b^2*c*d^
3 + 2*(-I*A^2 - 2*I*A*B - I*B^2)*a^3*b*d^4 + (7*I*B^2*b^4*c^3*d + 24*I*B^2*
a*b^3*c^2*d^2 - 24*I*B^2*a^2*b^2*c*d^3 - 7*I*B^2*a^3*b*d^4)*n^2 + 6*((I*A*B
 + I*B^2)*b^4*c^3*d + (-I*A*B - I*B^2)*a*b^3*c^2*d^2 + (-I*A*B - I*B^2)*a^2
*b^2*c*d^3 + (I*A*B + I*B^2)*a^3*b*d^4)*n)*x + 2*(12*(I*A^2 + 2*I*A*B + I*B
^2)*a^2*b^2*c^2*d^2 + 6*(5*I*B^2*b^4*d^4*n^2 + 2*(I*A^2 + 2*I*A*B + I*B^2)*
b^4*d^4)*x^4 + 12*(2*(I*A^2 + 2*I*A*B + I*B^2)*b^4*c*d^3 + 2*(I*A^2 + 2*I*A
*B + I*B^2)*a*b^3*d^4 + 5*(I*B^2*b^4*c*d^3 + I*B^2*a*b^3*d^4)*n^2 + 2*((I*A
*B + I*B^2)*b^4*c*d^3 + (-I*A*B - I*B^2)*a*b^3*d^4)*n)*x^3 + (-I*B^2*b^4*c^
```

```
4 + 16*I*B^2*a*b^3*c^3*d + 16*I*B^2*a^3*b*c*d^3 - I*B^2*a^4*d^4)*n^2 + 6*(2
*(I*A^2 + 2*I*A*B + I*B^2)*b^4*c^2*d^2 + 8*(I*A^2 + 2*I*A*B + I*B^2)*a*b^3*
c*d^3 + 2*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b^2*d^4 + (7*I*B^2*b^4*c^2*d^2 + 16
*I*B^2*a*b^3*c*d^3 + 7*I*B^2*a^2*b^2*d^4)*n^2 + 6*((I*A*B + I*B^2)*b^4*c^2*
d^2 + (-I*A*B - I*B^2)*a^2*b^2*d^4)*n)*x^2 + 2*((-I*A*B - I*B^2)*b^4*c^4 +
8*(I*A*B + I*B^2)*a*b^3*c^3*d + 8*(-I*A*B - I*B^2)*a^3*b*c*d^3 + (I*A*B + I
*B^2)*a^4*d^4)*n + 4*(6*(I*A^2 + 2*I*A*B + I*B^2)*a*b^3*c^2*d^2 + 6*(I*A^2
+ 2*I*A*B + I*B^2)*a^2*b^2*c*d^3 + 3*(I*B^2*b^4*c^3*d + 4*I*B^2*a*b^3*c^2*d
^2 + 4*I*B^2*a^2*b^2*c*d^3 + I*B^2*a^3*b*d^4)*n^2 + 2*((I*A*B + I*B^2)*b^4*
c^3*d + 6*(I*A*B + I*B^2)*a*b^3*c^2*d^2 + 6*(-I*A*B - I*B^2)*a^2*b^2*c*d^3
+ (-I*A*B - I*B^2)*a^3*b*d^4)*n)*x)*log((b*x + a)/(d*x + c)))/((b^7*c^5*d^2
 - 5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a^3*b^4*c^2*d^5 + 5*a^4*b^3*c*
d^6 - a^5*b^2*d^7)*g^3*x^4 + 2*(b^7*c^6*d - 4*a*b^6*c^5*d^2 + 5*a^2*b^5*c^4
*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a^6*b*d^7)*g^3*x^3 + (b^7*c^7
- a*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4*c^4*d^3 - 25*a^4*b^3*c^3*d^4
 + 9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*g^3*x^2 + 2*(a*b^6*c^7 - 4*a^
2*b^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2*c^3*d^4 + 4*a^6*b*c^2*d^5 - a^7
*c*d^6)*g^3*x + (a^2*b^5*c^7 - 5*a^3*b^4*c^6*d + 10*a^4*b^3*c^5*d^2 - 10*a^
5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c^2*d^5)*g^3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/((b*g*x + a*g)^3*(I*d*x
+ I*c)^3), x)
```

Mupad [**B**]
time = 11.67, size = 2419, normalized size = 3.30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^3*(c*i + d*i*x)
^3),x)
```

```
[Out] ((3*x^2*(6*A^2*a*b^2*d^3 + 6*A^2*b^3*c*d^2 + 15*B^2*a*b^2*d^3*n^2 + 15*B^2*
b^3*c*d^2*n^2 - 4*A*B*a*b^2*d^3*n + 4*A*B*b^3*c*d^2*n))/(a*d - b*c) - (2*A^
2*a^3*d^3 + 2*A^2*b^3*c^3 + B^2*a^3*d^3*n^2 + B^2*b^3*c^3*n^2 - 14*A^2*a*b^
2*c^2*d - 14*A^2*a^2*b*c*d^2 - 2*A*B*a^3*d^3*n + 2*A*B*b^3*c^3*n - 31*B^2*a
*b^2*c^2*d*n^2 - 31*B^2*a^2*b*c*d^2*n^2 - 30*A*B*a*b^2*c^2*d*n + 30*A*B*a^2
*b*c*d^2*n)/(2*(a*d - b*c)) + (2*x*(2*A^2*a^2*b*d^3 + 2*A^2*b^3*c^2*d + 14*
A^2*a*b^2*c*d^2 + 7*B^2*a^2*b*d^3*n^2 + 7*B^2*b^3*c^2*d*n^2 + 31*B^2*a*b^2*
c*d^2*n^2 - 6*A*B*a^2*b*d^3*n + 6*A*B*b^3*c^2*d*n))/(a*d - b*c) + (6*x^3*(2
*A^2*b^3*d^3 + 5*B^2*b^3*d^3*n^2))/(a*d - b*c))/(x^4*(2*a^3*b^2*d^5*g^3*i^3
 - 2*b^5*c^3*d^2*g^3*i^3 + 6*a*b^4*c^2*d^3*g^3*i^3 - 6*a^2*b^3*c*d^4*g^3*i^
3) - x*(4*a*b^4*c^5*g^3*i^3 - 4*a^5*c*d^4*g^3*i^3 - 8*a^2*b^3*c^4*d*g^3*i^3
 + 8*a^4*b*c^2*d^3*g^3*i^3) + x^3*(4*a^4*b*d^5*g^3*i^3 - 4*b^5*c^4*d*g^3*i^
3 + 8*a*b^4*c^3*d^2*g^3*i^3 - 8*a^3*b^2*c*d^4*g^3*i^3) + x^2*(2*a^5*d^5*g^3
*i^3 - 2*b^5*c^5*g^3*i^3 - 2*a*b^4*c^4*d*g^3*i^3 + 2*a^4*b*c*d^4*g^3*i^3 +
16*a^2*b^3*c^3*d^2*g^3*i^3 - 16*a^3*b^2*c^2*d^3*g^3*i^3) - 2*a^2*b^3*c^5*g^
3*i^3 + 2*a^5*c^2*d^3*g^3*i^3 + 6*a^3*b^2*c^4*d*g^3*i^3 - 6*a^4*b*c^3*d^2*g
^3*i^3) + log(e*((a + b*x)/(c + d*x))^n)^2*((x*((3*B^2*b*d*(a*d + b*c)^2)/(
a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2 - (B^2*b*d)/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d
) + (6*B^2*a*b^2*c*d^2)/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) - (B^2*(a*d + b*
c))/(2*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (6*B^2*b^3*d^3*x^3)/(a^2*d^2 + b^
2*c^2 - 2*a*b*c*d)^2 + (9*B^2*b^2*d^2*x^2*(a*d + b*c))/(a^2*d^2 + b^2*c^2 -
 2*a*b*c*d)^2 + (3*B^2*a*b*c*d*(a*d + b*c))/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)
^2)/(x*(2*a*b*c^2*g^3*i^3 + 2*a^2*c*d*g^3*i^3) + x^3*(2*a*b*d^2*g^3*i^3 + 2
*b^2*c*d*g^3*i^3) + x^2*(a^2*d^2*g^3*i^3 + b^2*c^2*g^3*i^3 + 4*a*b*c*d*g^3*
i^3) + a^2*c^2*g^3*i^3 + b^2*d^2*g^3*i^3*x^4) - (6*A*B*b^2*d^2)/(g^3*i^3*n*
(a*d - b*c)^5)) + (log(e*((a + b*x)/(c + d*x))^n)*(x*((6*(a*d + b*c)*(A*B*a
*b*d^2 + A*B*b^2*c*d - B^2*a*b*d^2*n + B^2*b^2*c*d*n))/(a*d - b*c) - 2*A*B*
a*b*d^2 + 2*A*B*b^2*c*d + (12*A*B*a*b^2*c*d^2)/(a*d - b*c)) + x^2*((6*b*d*(
A*B*a*b*d^2 + A*B*b^2*c*d - B^2*a*b*d^2*n + B^2*b^2*c*d*n))/(a*d - b*c) + (
12*A*B*b^2*d^2*(a*d + b*c))/(a*d - b*c)) + (6*a*c*(A*B*a*b*d^2 + A*B*b^2*c*
d - B^2*a*b*d^2*n + B^2*b^2*c*d*n))/(a*d - b*c) - A*B*a^2*d^2 + A*B*b^2*c^2
 + (B^2*a^2*d^2*n)/2 + (B^2*b^2*c^2*n)/2 + (12*A*B*b^3*d^3*x^3)/(a*d - b*c)
 - B^2*a*b*c*d*n))/(x^4*(a^3*b^2*d^5*g^3*i^3 - b^5*c^3*d^2*g^3*i^3 + 3*a*b^
4*c^2*d^3*g^3*i^3 - 3*a^2*b^3*c*d^4*g^3*i^3) - x*(2*a*b^4*c^5*g^3*i^3 - 2*a
^5*c*d^4*g^3*i^3 - 4*a^2*b^3*c^4*d*g^3*i^3 + 4*a^4*b*c^2*d^3*g^3*i^3) + x^3
*(2*a^4*b*d^5*g^3*i^3 - 2*b^5*c^4*d*g^3*i^3 + 4*a*b^4*c^3*d^2*g^3*i^3 - 4*a
^3*b^2*c*d^4*g^3*i^3) + x^2*(a^5*d^5*g^3*i^3 - b^5*c^5*g^3*i^3 - a*b^4*c^4*
d*g^3*i^3 + a^4*b*c*d^4*g^3*i^3 + 8*a^2*b^3*c^3*d^2*g^3*i^3 - 8*a^3*b^2*c^2
*d^3*g^3*i^3) - a^2*b^3*c^5*g^3*i^3 + a^5*c^2*d^3*g^3*i^3 + 3*a^3*b^2*c^4*d
*g^3*i^3 - 3*a^4*b*c^3*d^2*g^3*i^3) + (b^2*d^2*atan((b^2*d^2*((a^5*d^5*g^3*
```

```
i^3 + b^5*c^5*g^3*i^3 - 3*a*b^4*c^4*d*g^3*i^3 - 3*a^4*b*c*d^4*g^3*i^3 + 2*a
^2*b^3*c^3*d^2*g^3*i^3 + 2*a^3*b^2*c^2*d^3*g^3*i^3)/(a^4*d^4*g^3*i^3 + b^4*
c^4*g^3*i^3 - 4*a*b^3*c^3*d*g^3*i^3 - 4*a^3*b*c*d^3*g^3*i^3 + 6*a^2*b^2*c^2
*d^2*g^3*i^3) + 2*b*d*x)*(2*A^2 + 5*B^2*n^2)*(a^4*d^4*g^3*i^3 + b^4*c^4*g^3
*i^3 - 4*a*b^3*c^3*d*g^3*i^3 - 4*a^3*b*c*d^3*g^3*i^3 + 6*a^2*b^2*c^2*d^2*g^
3*i^3)*3i)/(g^3*i^3*(6*A^2*b^2*d^2 + 15*B^2*b^2*d^2*n^2)*(a*d - b*c)^5))*(2
*A^2 + 5*B^2*n^2)*6i)/(g^3*i^3*(a*d - b*c)^5) - (2*B^2*b^2*d^2*log(e*((a +
b*x)/(c + d*x))^n)^3)/(g^3*i^3*n*(a*d - b*c)^5)
```

3.209 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)^3}\,dx$

Optimal. Leaf size=908

$$-\frac{B^2d^5n^2(a+bx)^2}{4(bc-ad)^6g^4i^3(c+dx)^2}-\frac{10AbBd^4n(a+bx)}{(bc-ad)^6g^4i^3(c+dx)}+\frac{10bB^2d^4n^2(a+bx)}{(bc-ad)^6g^4i^3(c+dx)}-\frac{20b^3B^2d^2n^2(c+dx)}{(bc-ad)^6g^4i^3(a+bx)}+\frac{5}{4(bc}$$

```
[Out] -1/4*B^2*d^5*n^2*(b*x+a)^2/(-a*d+b*c)^6/g^4/i^3/(d*x+c)^2-10*A*b*B*d^4*n*(b
*x+a)/(-a*d+b*c)^6/g^4/i^3/(d*x+c)+10*b*B^2*d^4*n^2*(b*x+a)/(-a*d+b*c)^6/g^
4/i^3/(d*x+c)-20*b^3*B^2*d^2*n^2*(d*x+c)/(-a*d+b*c)^6/g^4/i^3/(b*x+a)+5/4*b
^4*B^2*d*n^2*(d*x+c)^2/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^2-2/27*b^5*B^2*n^2*(d*x
+c)^3/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^3-10*b*B^2*d^4*n*(b*x+a)*ln(e*((b*x+a)/(
d*x+c))^n)/(-a*d+b*c)^6/g^4/i^3/(d*x+c)+1/2*B*d^5*n*(b*x+a)^2*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))/(-a*d+b*c)^6/g^4/i^3/(d*x+c)^2-20*b^3*B*d^2*n*(d*x+c)*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^6/g^4/i^3/(b*x+a)+5/2*b^4*B*d*n*(d
*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^2-2/9*
b^5*B*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^6/g^4/i^3/(b*x
+a)^3-1/2*d^5*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^6/g^4/
i^3/(d*x+c)^2+5*b*d^4*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^
6/g^4/i^3/(d*x+c)-10*b^3*d^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*
d+b*c)^6/g^4/i^3/(b*x+a)+5/2*b^4*d*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)
)^2/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^2-1/3*b^5*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*
x+c))^n))^2/(-a*d+b*c)^6/g^4/i^3/(b*x+a)^3-10/3*b^2*d^3*(A+B*ln(e*((b*x+a)/
(d*x+c))^n))^3/B/(-a*d+b*c)^6/g^4/i^3/n
```

Rubi [A]
time = 0.45, antiderivative size = 908, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 8, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}} = 0.178$, Rules used = {2561, 2395, 2333, 2332, 2342, 2341, 2339, 30}

$$-\frac{2B^2n^2(c+dx)^3b^5}{27(bc-ad)^6g^4i^3(a+bx)^3}-\frac{(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2b^5}{3(bc-ad)^6g^4i^3(a+bx)^3}-\frac{2Bn(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^5}{9(bc-ad)^6g^4i^3(a+bx)^3}+\frac{5B^2dn^2(c+dx)^2b^4}{4(bc-ad)^6g^4i^3(a+bx)^2}+\frac{5d(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2b^4}{2(bc-ad)^6g^4i^3(a+bx)^2}+\frac{5Bdn(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^4}{2(bc-ad)^6g^4i^3(a+bx)^2}-\frac{10d^2(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2b^3}{(bc-ad)^6g^4i^3(a+bx)}-\frac{20B^2d^2n^2(c+dx)b^3}{(bc-ad)^6g^4i^3(a+bx)}-\frac{20Bd^2n(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^3}{(bc-ad)^6g^4i^3(a+bx)}-\frac{10d^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3b^2}{3B(bc-ad)^6g^4i^3n}+\frac{5d^4(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2b}{(bc-ad)^6g^4i^3(c+dx)}-\frac{10B^2d^4n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)b}{(bc-ad)^6g^4i^3(c+dx)}+\frac{10B^2d^4n^2(a+bx)b}{(bc-ad)^6g^4i^3(c+dx)}-\frac{10ABd^4n(a+bx)b}{(bc-ad)^6g^4i^3(c+dx)}-\frac{d^5(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2(bc-ad)^6g^4i^3(c+dx)^2}+\frac{Bd^5n(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2(bc-ad)^6g^4i^3(c+dx)^2}-\frac{B^2d^5n^2(a+bx)^2}{4(bc-ad)^6g^4i^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i + d*i*x)
^3),x]
```

```
[Out] -1/4*(B^2*d^5*n^2*(a + b*x)^2)/((b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (10*A*
b*B*d^4*n*(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) + (10*b*B^2*d^4*n^2*
(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (20*b^3*B^2*d^2*n^2*(c + d*x
))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B^2*d*n^2*(c + d*x)^2)/(4*(b*
c - a*d)^6*g^4*i^3*(a + b*x)^2) - (2*b^5*B^2*n^2*(c + d*x)^3)/(27*(b*c - a*
d)^6*g^4*i^3*(a + b*x)^3) - (10*b*B^2*d^4*n*(a + b*x)*Log[e*((a + b*x)/(c +
 d*x))^n])/((b*c - a*d)^6*g^4*i^3*(c + d*x)) + (B*d^5*n*(a + b*x)^2*(A + B*
```

```
Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (2
0*b^3*B*d^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d
)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (2*b^5*B*n*(c + d*x)
^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^6*g^4*i^3*(a + b*
x)^3) - (d^5*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c
- a*d)^6*g^4*i^3*(c + d*x)^2) + (5*b*d^4*(a + b*x)*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2)/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*d^2*(c + d*x)
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^6*g^4*i^3*(a + b*x)
) + (5*b^4*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c
- a*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2)/(3*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (10*b^2*d^3*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^6*g^4*i^3*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2332

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(209c+209dx)^3(ag+bgx)^4}\,dx=-\frac{2b^2B^2n^2}{246491883(bc-ad)^3g^4(a+bx)^3}+\frac{37b^2B^2dn^2}{328655844(bc-ad)^4g^4(a+bx)^2}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 2138 vs. $2(908) = 1816$.
time = 2.50, size = 2138, normalized size = 2.35

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i +
d*i*x)^3),x]
```

```
[Out] -1/108*(360*b^2*B^2*d^3*n^2*(a + b*x)^3*(c + d*x)^2*Log[(a + b*x)/(c + d*x)
]^3 + 18*B*n*Log[(a + b*x)/(c + d*x)]^2*(60*a^3*A*b^2*c^2*d^3 + 2*b^5*B*c^5
*n - 15*a*b^4*B*c^4*d*n + 60*a^2*b^3*B*c^3*d^2*n - 30*a^4*b*B*c*d^4*n + 3*a
^5*B*d^5*n + 180*a^2*A*b^3*c^2*d^3*x + 120*a^3*A*b^2*c*d^4*x - 5*b^5*B*c^4*
d*n*x + 60*a*b^4*B*c^3*d^2*n*x + 180*a^2*b^3*B*c^2*d^3*n*x - 120*a^3*b^2*B*
c*d^4*n*x - 15*a^4*b*B*d^5*n*x + 180*a*A*b^4*c^2*d^3*x^2 + 360*a^2*A*b^3*c*
d^4*x^2 + 60*a^3*A*b^2*d^5*x^2 + 20*b^5*B*c^3*d^2*n*x^2 + 270*a*b^4*B*c^2*d
^3*n*x^2 - 90*a^3*b^2*B*d^5*n*x^2 + 60*A*b^5*c^2*d^3*x^3 + 360*a*A*b^4*c*d^
```

```
4*x^3 + 180*a^2*A*b^3*d^5*x^3 + 110*b^5*B*c^2*d^3*n*x^3 + 180*a*b^4*B*c*d^4
*n*x^3 - 90*a^2*b^3*B*d^5*n*x^3 + 120*A*b^5*c*d^4*x^4 + 180*a*A*b^4*d^5*x^4
 + 100*b^5*B*c*d^4*n*x^4 + 60*A*b^5*d^5*x^5 + 20*b^5*B*d^5*n*x^5 + 60*b^2*B
*d^3*(a + b*x)^3*(c + d*x)^2*Log[e*((a + b*x)/(c + d*x))^n] - 60*b^2*B*d^3*
n*(a + b*x)^3*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]) + 6*b^2*d^2*(b*c - a*d)
*(a + b*x)^2*(c + d*x)^2*(108*A^2 + 282*A*B*n + 319*B^2*n^2 + 108*B^2*Log[e
*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(36*A + 47*B*n)*Log[(a + b*x)/(c + d*x)
] + 108*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x)
)^n]*(36*A + 47*B*n - 36*B*n*Log[(a + b*x)/(c + d*x)])) - 3*b^2*d*(b*c - a*
d)^2*(a + b*x)*(c + d*x)^2*(54*A^2 + 66*A*B*n + 37*B^2*n^2 + 54*B^2*Log[e*(
(a + b*x)/(c + d*x))^n]^2 - 6*B*n*(18*A + 11*B*n)*Log[(a + b*x)/(c + d*x)]
+ 54*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n
]*(18*A + 11*B*n - 18*B*n*Log[(a + b*x)/(c + d*x)])) + 4*b^2*(b*c - a*d)^3*
(c + d*x)^2*(9*A^2 + 6*A*B*n + 2*B^2*n^2 + 9*B^2*Log[e*((a + b*x)/(c + d*x)
)^n]^2 - 6*B*n*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] + 9*B^2*n^2*Log[(a + b*
x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*Log
[(a + b*x)/(c + d*x)])) + 60*b^2*d^3*(a + b*x)^3*(c + d*x)^2*Log[a + b*x]*(
18*A^2 + 12*A*B*n + 49*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 -
12*B*n*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c +
 d*x)]^2 + 12*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*Log[(a +
b*x)/(c + d*x)])) + 27*d^3*(b*c - a*d)^2*(a + b*x)^3*(2*A^2 - 2*A*B*n + B^2
*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*Log[(a +
 b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b
*x)/(c + d*x))^n]*(-2*A + B*n + 2*B*n*Log[(a + b*x)/(c + d*x)])) + 54*b*d^3
*(b*c - a*d)*(a + b*x)^3*(c + d*x)*(8*A^2 - 18*A*B*n + 19*B^2*n^2 + 8*B^2*L
og[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-8*A + 9*B*n)*Log[(a + b*x)/(c + d
*x)] + 8*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x
))^n]*(-8*A + 9*B*n + 8*B*n*Log[(a + b*x)/(c + d*x)])) + 6*B*(b*c - a*d)*n*
Log[(a + b*x)/(c + d*x)]*(18*b*d^3*(a + b*x)^3*(c + d*x)*(8*A - 9*B*n + 8*B
*Log[e*((a + b*x)/(c + d*x))^n] - 8*B*n*Log[(a + b*x)/(c + d*x)]) + 4*b^2*(
b*c - a*d)^2*(c + d*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n] -
3*B*n*Log[(a + b*x)/(c + d*x)]) + 9*d^3*(b*c - a*d)*(a + b*x)^3*(2*A - B*n
+ 2*B*Log[e*((a + b*x)/(c + d*x))^n] - 2*B*n*Log[(a + b*x)/(c + d*x)]) - 3*
b^2*d*(b*c - a*d)*(a + b*x)*(c + d*x)^2*(18*A + 11*B*n + 18*B*(Log[e*((a +
b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])) + 6*b^2*d^2*(a + b*x)^2*(
c + d*x)^2*(36*A + 47*B*n + 36*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a
 + b*x)/(c + d*x)]))) - 60*b^2*d^3*(a + b*x)^3*(c + d*x)^2*(18*A^2 + 12*A*B
*n + 49*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 12*B*n*(3*A + B
*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 12*B
*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*Log[(a + b*x)/(c + d*x)]
))*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3*(a + b*x)^3*(c + d*x)^2)
```

Maple [F]

time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{\left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}}{\left(bgx + ag\right)^{4}\left(dix + ci\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)

[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)

Maxima [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 8914 vs. 2(848) = 1696.
time = 2.28, size = 8914, normalized size = 9.82

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, algorithm="maxima")

[Out] 1/6*B^2*(60*b^2*d^3*log(b*x + a)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) - 60*b^2*d^3*log(d*x + c)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) + (60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((I*b^8*c^5*d^2 - 5*I*a*b^7*c^4*d^3 + 10*I*a^2*b^6*c^3*d^4 - 10*I*a^3*b^5*c^2*d^5 + 5*I*a^4*b^4*c*d^6 - I*a^5*b^3*d^7)*g^4*x^5 + (2*I*b^8*c^6*d - 7*I*a*b^7*c^5*d^2 + 5*I*a^2*b^6*c^4*d^3 + 10*I*a^3*b^5*c^3*d^4 - 20*I*a^4*b^4*c^2*d^5 + 13*I*a^5*b^3*c*d^6 - 3*I*a^6*b^2*d^7)*g^4*x^4 + (I*b^8*c^7 + I*a*b^7*c^6*d - 17*I*a^2*b^6*c^5*d^2 + 35*I*a^3*b^5*c^4*d^3 - 25*I*a^4*b^4*c^3*d^4 - I*a^5*b^3*c^2*d^5 + 9*I*a^6*b^2*c*d^6 - 3*I*a^7*b*d^7)*g^4*x^3 + (3*I*a*b^7*c^7 - 9*I*a^2*b^6*c^6*d + I*a^3*b^5*c^5*d^2 + 25*I*a^4*b^4*c^4*d^3 - 35*I*a^5*b^3*c^3*d^4 + 17*I*a^6*b^2*c^2*d^5 - I*a^7*b*c*d^6 - I*a^8*d^7)*g^4*x^2 + (3*I*a^2*b^6*c^7 - 13*I*a^3*b^5*c^6*d + 20*I*a^4*b^4*c^5*d^2 - 10*I*a^5*b^3*c^4*d^3 - 5*I*a^6*b^2*c^3*d^4 + 7*I*a^7*b*c^2*d^5 - 2*I*a^8*c*d^6)*g^4*x + (I*a^3*b^5*c^7 - 5*I*a^4*b^4*c^6*d + 10*I*a^5*b^3*c^5*d^2 - 10*I*a^6*b^2*c^4*d^3 + 5*I*a^7*b*c^3*d^4 - I*a^8*c^2*d^5)*g^4))*log((b*x/(d*x + c) + a/(d*x + c))^n*e)^2 + 1/3*A*B*(60*b^2*d^3*log(b*x + a)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) - 60*b^2*d^3*log(d*x + c)/((I*b^6*c^6 - 6*I*a*b^5*c^5*d + 15*I*a^2*b^4*c^4*d^2 - 20*I*a^3*b^3*c^3*d^3 + 15*I*a^4*b^2*c^2*d^4 - 6*I*a^5*b*c*d^5 + I*a^6*d^6)*g^4) + (60*b^4*d^4*x^4 + 2*b^4*c

```
^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*
(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a
^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^
3*b*d^4)*x)/((I*b^8*c^5*d^2 - 5*I*a*b^7*c^4*d^3 + 10*I*a^2*b^6*c^3*d^4 - 10
*I*a^3*b^5*c^2*d^5 + 5*I*a^4*b^4*c*d^6 - I*a^5*b^3*d^7)*g^4*x^5 + (2*I*b^8*
c^6*d - 7*I*a*b^7*c^5*d^2 + 5*I*a^2*b^6*c^4*d^3 + 10*I*a^3*b^5*c^3*d^4 - 20
*I*a^4*b^4*c^2*d^5 + 13*I*a^5*b^3*c*d^6 - 3*I*a^6*b^2*d^7)*g^4*x^4 + (I*b^8
*c^7 + I*a*b^7*c^6*d - 17*I*a^2*b^6*c^5*d^2 + 35*I*a^3*b^5*c^4*d^3 - 25*I*a
^4*b^4*c^3*d^4 - I*a^5*b^3*c^2*d^5 + 9*I*a^6*b^2*c*d^6 - 3*I*a^7*b*d^7)*g^4
*x^3 + (3*I*a*b^7*c^7 - 9*I*a^2*b^6*c^6*d + I*a^3*b^5*c^5*d^2 + 25*I*a^4*b^
4*c^4*d^3 - 35*I*a^5*b^3*c^3*d^4 + 17*I*a^6*b^2*c^2*d^5 - I*a^7*b*c*d^6 - I
*a^8*d^7)*g^4*x^2 + (3*I*a^2*b^6*c^7 - 13*I*a^3*b^5*c^6*d + 20*I*a^4*b^4*c^
5*d^2 - 10*I*a^5*b^3*c^4*d^3 - 5*I*a^6*b^2*c^3*d^4 + 7*I*a^7*b*c^2*d^5 - 2*
I*a^8*c*d^6)*g^4*x + (I*a^3*b^5*c^7 - 5*I*a^4*b^4*c^6*d + 10*I*a^5*b^3*c^5*
d^2 - 10*I*a^6*b^2*c^4*d^3 + 5*I*a^7*b*c^3*d^4 - I*a^8*c^2*d^5)*g^4))*log((
b*x/(d*x + c) + a/(d*x + c))^n*e) + 1/108*((-8*I*b^5*c^5 + 135*I*a*b^4*c^4*
d - 2160*I*a^2*b^3*c^3*d^2 + 980*I*a^3*b^2*c^2*d^3 + 1080*I*a^4*b*c*d^4 - 2
7*I*a^5*d^5 - 2940*(I*b^5*c*d^4 - I*a*b^4*d^5)*x^4 - 30*(159*I*b^5*c^2*d^3
+ 74*I*a*b^4*c*d^4 - 233*I*a^2*b^3*d^5)*x^3 - 360*(I*b^5*d^5*x^5 + I*a^3*b^
2*c^2*d^3 + (2*I*b^5*c*d^4 + 3*I*a*b^4*d^5)*x^4 + (I*b^5*c^2*d^3 + 6*I*a*b^
4*c*d^4 + 3*I*a^2*b^3*d^5)*x^3 + (3*I*a*b^4*c^2*d^3 + 6*I*a^2*b^3*c*d^4 + I
*a^3*b^2*d^5)*x^2 + (3*I*a^2*b^3*c^2*d^3 + 2*I*a^3*b^2*c*d^4)*x)*log(b*x +
a)^3 - 360*(-I*b^5*d^5*x^5 - I*a^3*b^2*c^2*d^3 + (-2*I*b^5*c*d^4 - 3*I*a*b^
4*d^5)*x^4 + (-I*b^5*c^2*d^3 - 6*I*a*b^4*c*d^4 - 3*I*a^2*b^3*d^5)*x^3 + (-3
*I*a*b^4*c^2*d^3 - 6*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*x^2 + (-3*I*a^2*b^3*c
^2*d^3 - 2*I*a^3*b^2*c*d^4)*x)*log(d*x + c)^3 - 10*(170*I*b^5*c^3*d^2 + 921
*I*a*b^4*c^2*d^3 - 588*I*a^2*b^3*c*d^4 - 503*I*a^3*b^2*d^5)*x^2 - 360*(-I*b
^5*d^5*x^5 - I*a^3*b^2*c^2*d^3 + (-2*I*b^5*c*d^4 - 3*I*a*b^4*d^5)*x^4 + (-I
*b^5*c^2*d^3 - 6*I*a*b^4*c*d^4 - 3*I*a^2*b^3*d^5)*x^3 + (-3*I*a*b^4*c^2*d^3
 - 6*I*a^2*b^3*c*d^4 - I*a^3*b^2*d^5)*x^2 + (-3*I*a^2*b^3*c^2*d^3 - 2*I*a^3
*b^2*c*d^4)*x)*log(b*x + a)^2 - 360*(-I*b^5*d^5*x^5 - I*a^3*b^2*c^2*d^3 + (
-2*I*b^5*c*d^4 - 3*I*a*b^4*d^5)*x^4 + (-I*b^5*c^2*d^3 - 6*I*a*b^4*c*d^4 - 3
*I*a^2*b^3*d^5)*x^3 + (-3*I*a*b^4*c^2*d^3 - 6*I*a^2*b^3*c*d^4 - I*a^3*b^2*d
^5)*x^2 + (-3*I*a^2*b^3*c^2*d^3 - 2*I*a^3*b^2*c*d^4)*x + 3*(I*b^5*d^5*x^5 +
 I*a^3*b^2*c^2*d^3 + (2*I*b^5*c*d^4 + 3*I*a*b^4*d^5)*x^4 + (I*b^5*c^2*d^3 +
 6*I*a*b^4*c*d^4 + 3*I*a^2*b^3*d^5)*x^3 + (3*I*a*b^4*c^2*d^3 + 6*I*a^2*b^3*
c*d^4 + I*a^3*b^2*d^5)*x^2 + (3*I*a^2*b^3*c^2*d^3 + 2*I*a^3*b^2*c*d^4)*x)*l
og(b*x + a))*log(d*x + c)^2 - 5*(-19*I*b^5*c^4*d + 756*I*a*b^4*c^3*d^2 + 70
8*I*a^2*b^3*c^2*d^3 - 1256*I*a^3*b^2*c*d^4 - 189*I*a^4*b*d^5)*x - 2940*(I*b
^5*d^5*x^5 + I*a^3*b^2*c^2*d^3 + (2*I*b^5*c*d^4 + 3*I*a*b^4*d^5)*x^4 + (I*b
^5*c^2*d^3 + 6*I*a*b^4*c*d^4 + 3*I*a^2*b^3*d^5)*x^3 + (3*I*a*b^4*c^2*d^3 +
6*I*a^2*b^3*c*d^4 + I*a^3*b^2*d^5)*x^2 + (3*I*a...
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3747 vs. $2(848) = 1696$.

time = 0.51, size = 3747, normalized size = 4.13

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] -1/108*(36*(I*A^2 + 2*I*A*B + I*B^2)*b^5*c^5 + 270*(-I*A^2 - 2*I*A*B - I*B^
2)*a*b^4*c^4*d + 1080*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b^3*c^3*d^2 + 360*(-I*A
^2 - 2*I*A*B - I*B^2)*a^3*b^2*c^2*d^3 + 540*(-I*A^2 - 2*I*A*B - I*B^2)*a^4*
b*c*d^4 + 54*(I*A^2 + 2*I*A*B + I*B^2)*a^5*d^5 + 60*(18*(I*A^2 + 2*I*A*B +
I*B^2)*b^5*c*d^4 + 18*(-I*A^2 - 2*I*A*B - I*B^2)*a*b^4*d^5 + 49*(I*B^2*b^5*
c*d^4 - I*B^2*a*b^4*d^5)*n^2 + 12*((I*A*B + I*B^2)*b^5*c*d^4 + (-I*A*B - I*
B^2)*a*b^4*d^5)*n)*x^4 + 30*(54*(I*A^2 + 2*I*A*B + I*B^2)*b^5*c^2*d^3 + 36*
(I*A^2 + 2*I*A*B + I*B^2)*a*b^4*c*d^4 + 90*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b
^3*d^5 + (159*I*B^2*b^5*c^2*d^3 + 74*I*B^2*a*b^4*c*d^4 - 233*I*B^2*a^2*b^3*
d^5)*n^2 + 24*(3*(I*A*B + I*B^2)*b^5*c^2*d^3 + 2*(-I*A*B - I*B^2)*a*b^4*c*d
^4 + (-I*A*B - I*B^2)*a^2*b^3*d^5)*n)*x^3 + 360*(I*B^2*b^5*d^5*n^2*x^5 + I*
B^2*a^3*b^2*c^2*d^3*n^2 + (2*I*B^2*b^5*c*d^4 + 3*I*B^2*a*b^4*d^5)*n^2*x^4 +
 (I*B^2*b^5*c^2*d^3 + 6*I*B^2*a*b^4*c*d^4 + 3*I*B^2*a^2*b^3*d^5)*n^2*x^3 +
(3*I*B^2*a*b^4*c^2*d^3 + 6*I*B^2*a^2*b^3*c*d^4 + I*B^2*a^3*b^2*d^5)*n^2*x^2
 + (3*I*B^2*a^2*b^3*c^2*d^3 + 2*I*B^2*a^3*b^2*c*d^4)*n^2*x)*log((b*x + a)/(
d*x + c))^3 - (-8*I*B^2*b^5*c^5 + 135*I*B^2*a*b^4*c^4*d - 2160*I*B^2*a^2*b^
3*c^3*d^2 + 980*I*B^2*a^3*b^2*c^2*d^3 + 1080*I*B^2*a^4*b*c*d^4 - 27*I*B^2*a
^5*d^5)*n^2 + 10*(36*(I*A^2 + 2*I*A*B + I*B^2)*b^5*c^3*d^2 + 378*(I*A^2 + 2
*I*A*B + I*B^2)*a*b^4*c^2*d^3 + 216*(-I*A^2 - 2*I*A*B - I*B^2)*a^2*b^3*c*d^
4 + 198*(-I*A^2 - 2*I*A*B - I*B^2)*a^3*b^2*d^5 + (170*I*B^2*b^5*c^3*d^2 + 9
21*I*B^2*a*b^4*c^2*d^3 - 588*I*B^2*a^2*b^3*c*d^4 - 503*I*B^2*a^3*b^2*d^5)*n
^2 + 12*(11*(I*A*B + I*B^2)*b^5*c^3*d^2 + 21*(I*A*B + I*B^2)*a*b^4*c^2*d^3
+ 39*(-I*A*B - I*B^2)*a^2*b^3*c*d^4 + 7*(I*A*B + I*B^2)*a^3*b^2*d^5)*n)*x^2
 + 18*(60*(I*A*B + I*B^2)*a^3*b^2*c^2*d^3*n + 20*(I*B^2*b^5*d^5*n^2 + 3*(I*
A*B + I*B^2)*b^5*d^5*n)*x^5 + 20*(5*I*B^2*b^5*c*d^4*n^2 + 3*(2*(I*A*B + I*B
^2)*b^5*c*d^4 + 3*(I*A*B + I*B^2)*a*b^4*d^5)*n)*x^4 + 10*((11*I*B^2*b^5*c^2
*d^3 + 18*I*B^2*a*b^4*c*d^4 - 9*I*B^2*a^2*b^3*d^5)*n^2 + 6*((I*A*B + I*B^2)
*b^5*c^2*d^3 + 6*(I*A*B + I*B^2)*a*b^4*c*d^4 + 3*(I*A*B + I*B^2)*a^2*b^3*d^
5)*n)*x^3 + (2*I*B^2*b^5*c^5 - 15*I*B^2*a*b^4*c^4*d + 60*I*B^2*a^2*b^3*c^3*
d^2 - 30*I*B^2*a^4*b*c*d^4 + 3*I*B^2*a^5*d^5)*n^2 + 10*((2*I*B^2*b^5*c^3*d^
2 + 27*I*B^2*a*b^4*c^2*d^3 - 9*I*B^2*a^3*b^2*d^5)*n^2 + 6*(3*(I*A*B + I*B^2
)*a*b^4*c^2*d^3 + 6*(I*A*B + I*B^2)*a^2*b^3*c*d^4 + (I*A*B + I*B^2)*a^3*b^2
*d^5)*n)*x^2 + 5*((-I*B^2*b^5*c^4*d + 12*I*B^2*a*b^4*c^3*d^2 + 36*I*B^2*a^2
*b^3*c^2*d^3 - 24*I*B^2*a^3*b^2*c*d^4 - 3*I*B^2*a^4*b*d^5)*n^2 + 12*(3*(I*A
*B + I*B^2)*a^2*b^3*c^2*d^3 + 2*(I*A*B + I*B^2)*a^3*b^2*c*d^4)*n)*x)*log((b
*x + a)/(d*x + c))^2 + 6*(4*(I*A*B + I*B^2)*b^5*c^5 + 45*(-I*A*B - I*B^2)*a
*b^4*c^4*d + 360*(I*A*B + I*B^2)*a^2*b^3*c^3*d^2 + 490*(-I*A*B - I*B^2)*a^3
```

```
*b^2*c^2*d^3 + 180*(I*A*B + I*B^2)*a^4*b*c*d^4 + 9*(-I*A*B - I*B^2)*a^5*d^5
)*n + 5*(18*(-I*A^2 - 2*I*A*B - I*B^2)*b^5*c^4*d + 216*(I*A^2 + 2*I*A*B + I
*B^2)*a*b^4*c^3*d^2 + 432*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b^3*c^2*d^3 + 576*(
-I*A^2 - 2*I*A*B - I*B^2)*a^3*b^2*c*d^4 + 54*(-I*A^2 - 2*I*A*B - I*B^2)*a^4
*b*d^5 + (-19*I*B^2*b^5*c^4*d + 756*I*B^2*a*b^4*c^3*d^2 + 708*I*B^2*a^2*b^3
*c^2*d^3 - 1256*I*B^2*a^3*b^2*c*d^4 - 189*I*B^2*a^4*b*d^5)*n^2 + 6*(5*(-I*A
*B - I*B^2)*b^5*c^4*d + 108*(I*A*B + I*B^2)*a*b^4*c^3*d^2 + 78*(-I*A*B - I*
B^2)*a^2*b^3*c^2*d^3 + 52*(-I*A*B - I*B^2)*a^3*b^2*c*d^4 + 27*(I*A*B + I*B^
2)*a^4*b*d^5)*n)*x + 6*(180*(I*A^2 + 2*I*A*B + I*B^2)*a^3*b^2*c^2*d^3 + 10*
(49*I*B^2*b^5*d^5*n^2 + 12*(I*A*B + I*B^2)*b^5*d^5*n + 18*(I*A^2 + 2*I*A*B
+ I*B^2)*b^5*d^5)*x^5 + 10*(60*(I*A*B + I*B^2)*b^5*c*d^4*n + 36*(I*A^2 + 2*
I*A*B + I*B^2)*b^5*c*d^4 + 54*(I*A^2 + 2*I*A*B + I*B^2)*a*b^4*d^5 + 5*(22*I
*B^2*b^5*c*d^4 + 27*I*B^2*a*b^4*d^5)*n^2)*x^4 + 10*(18*(I*A^2 + 2*I*A*B + I
*B^2)*b^5*c^2*d^3 + 108*(I*A^2 + 2*I*A*B + I*B^2)*a*b^4*c*d^4 + 54*(I*A^2 +
 2*I*A*B + I*B^2)*a^2*b^3*d^5 + 5*(17*I*B^2*b^5*c^2*d^3 + 54*I*B^2*a*b^4*c*
d^4 + 27*I*B^2*a^2*b^3*d^5)*n^2 + 6*(11*(I*A*B + I*B^2)*b^5*c^2*d^3 + 18*(I
*A*B + I*B^2)*a*b^4*c*d^4 + 9*(-I*A*B - I*B^2)*a^2*b^3*d^5)*n)*x^3 + (4*I*B
^2*b^5*c^5 - 45*I*B^2*a*b^4*c^4*d + 360*I*B^2*a^2*b^3*c^3*d^2 + 180*I*B^2*a
^4*b*c*d^4 - 9*I*B^2*a^5*d^5)*n^2 + 10*(54*(I*A^2 + 2*I*A*B + I*B^2)*a*b^4*
c^2*d^3 + 108*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b^3*c*d^4 + 18*(I*A^2 + 2*I*A*B
 + I*B^2)*a^3*b^2*d^5 + (22*I*B^2*b^5*c^3*d^2 + 189*I*B^2*a*b^4*c^2*d^3 + 2
16*I*B^2*a^2*b^3*c*d^4 + 63*I*B^2*a^3*b^2*d^5)*n^2 + 6*(2*(I*A*B + I*B^2)*b
^5*c^3*d^2 + 27*(I*A*B + I*B^2)*a*b^4*c^2*d^3 + 9*(-I*A*B - I*B^2)*a^3*b^2*
d^5)*n)*x^2 + 6*(2*(I*A*B + I*B^2)*b^5*c^5 + 15*(-I*A*B - I*B^2)*a*b^4*c^4*
d + 60*(I*A*B + I*B^2)*a^2*b^3*c^3*d^2 + 30*(-I*A*B - I*B^2)*a^4*b*c*d^4 +
3*(I*A*B + I*B^2)*a^5*d^5)*n + 5*(108*(I*A^2 + 2*I*A*B + I*B^2)*a^2*b^3*c^2
*d^3 + 72*(I*A^2 + 2*I*A*B + I*B^2)*a^3*b^2*c*d^4 + (-5*I*B^2*b^5*c^4*d + 1
08*I*B^2*a*b^4*c^3*d^2 + 216*I*B^2*a^2*b^3*c^2*d^3 + 144*I*B^2*a^3*b^2*c*d^
4 + 27*I*B^2*a^4*b*d^5)*n^2 + 6*((-I*A*B - I*B^2)*b^5*c^4*d + 12*(I*A*B + I
*B^2)*a*b^4*c^3*d^2 + 36*(I*A*B + I*B^2)*a^2*b^...
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^2/((b*g*x + a*g)^4*(I*d*x
+ I*c)^3), x)
```

Mupad [B]
time = 13.70, size = 2500, normalized size = 2.75

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/((a*g + b*g*x)^4*(c*i + d*i*x)
^3),x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)*((x*((a*d + b*c)*(20*A*B*a*b*d^2 + 10*A*B*b^
2*c*d - (70*B^2*a*b*d^2*n)/3 + (10*B^2*b^2*c*d*n)/3) + a*c*(30*A*B*b^2*d^2
- 20*B^2*b^2*d^2*n) + (5*B^2*a^2*b*d^3*n)/6 + (5*B^2*b^3*c^2*d*n)/6 - 5*A*B
*a^2*b*d^3 - 5*A*B*b^3*c^2*d + 10*A*B*a*b^2*c*d^2 - (5*B^2*a*b^2*c*d^2*n)/3
) + x^2*((a*d + b*c)*(30*A*B*b^2*d^2 - 20*B^2*b^2*d^2*n) + b*d*(20*A*B*a*b*
d^2 + 10*A*B*b^2*c*d - (70*B^2*a*b*d^2*n)/3 + (10*B^2*b^2*c*d*n)/3)) + a*c*
(20*A*B*a*b*d^2 + 10*A*B*b^2*c*d - (70*B^2*a*b*d^2*n)/3 + (10*B^2*b^2*c*d*n
)/3) - 3*A*B*a^3*d^3 - 2*A*B*b^3*c^3 + b*d*x^3*(30*A*B*b^2*d^2 - 20*B^2*b^2
*d^2*n) + (3*B^2*a^3*d^3*n)/2 - (2*B^2*b^3*c^3*n)/3 + A*B*a*b^2*c^2*d + 4*A
*B*a^2*b*c*d^2 + (17*B^2*a*b^2*c^2*d*n)/6 - (11*B^2*a^2*b*c*d^2*n)/3)/(x^5*
(3*a^4*b^3*d^6*g^4*i^3 + 3*b^7*c^4*d^2*g^4*i^3 - 12*a*b^6*c^3*d^3*g^4*i^3 -
 12*a^3*b^4*c*d^5*g^4*i^3 + 18*a^2*b^5*c^2*d^4*g^4*i^3) + x*(9*a^2*b^5*c^6*
g^4*i^3 + 6*a^7*c*d^5*g^4*i^3 - 30*a^3*b^4*c^5*d*g^4*i^3 - 15*a^6*b*c^2*d^4
*g^4*i^3 + 30*a^4*b^3*c^4*d^2*g^4*i^3) + x^2*(3*a^7*d^6*g^4*i^3 + 9*a*b^6*c
^6*g^4*i^3 + 6*a^6*b*c*d^5*g^4*i^3 - 18*a^2*b^5*c^5*d*g^4*i^3 - 15*a^3*b^4*
c^4*d^2*g^4*i^3 + 60*a^4*b^3*c^3*d^3*g^4*i^3 - 45*a^5*b^2*c^2*d^4*g^4*i^3)
+ x^3*(3*b^7*c^6*g^4*i^3 + 9*a^6*b*d^6*g^4*i^3 + 6*a*b^6*c^5*d*g^4*i^3 - 18
*a^5*b^2*c*d^5*g^4*i^3 - 45*a^2*b^5*c^4*d^2*g^4*i^3 + 60*a^3*b^4*c^3*d^3*g^
4*i^3 - 15*a^4*b^3*c^2*d^4*g^4*i^3) + x^4*(9*a^5*b^2*d^6*g^4*i^3 + 6*b^7*c^
5*d*g^4*i^3 - 15*a*b^6*c^4*d^2*g^4*i^3 - 30*a^4*b^3*c*d^5*g^4*i^3 + 30*a^3*
b^4*c^2*d^4*g^4*i^3) + 3*a^3*b^4*c^6*g^4*i^3 + 3*a^7*c^2*d^4*g^4*i^3 - 12*a
^4*b^3*c^5*d*g^4*i^3 - 12*a^6*b*c^3*d^3*g^4*i^3 + 18*a^5*b^2*c^4*d^2*g^4*i^
3) + (20*B*b^2*d^3*(3*A + B*n)*(x^2*((3*g^4*i^3*n*(a*d + b*c)^2*(a*d - b*c)
^5)/d + 6*a*b*c*g^4*i^3*n*(a*d - b*c)^5) + 6*b*g^4*i^3*n*x^3*(a*d + b*c)*(a
*d - b*c)^5 + 3*b^2*d*g^4*i^3*n*x^4*(a*d - b*c)^5 + (3*a^2*c^2*g^4*i^3*n*(a
*d - b*c)^5)/d + (6*a*c*g^4*i^3*n*x*(a*d + b*c)*(a*d - b*c)^5)/d))/(3*g^4*i
^3*n*(a*d - b*c)^6*(x^5*(3*a^4*b^3*d^6*g^4*i^3 + 3*b^7*c^4*d^2*g^4*i^3 - 12
*a*b^6*c^3*d^3*g^4*i^3 - 12*a^3*b^4*c*d^5*g^4*i^3 + 18*a^2*b^5*c^2*d^4*g^4*
i^3) + x*(9*a^2*b^5*c^6*g^4*i^3 + 6*a^7*c*d^5*g^4*i^3 - 30*a^3*b^4*c^5*d*g^
```

4*i^3 - 15*a^6*b*c^2*d^4*g^4*i^3 + 30*a^4*b^3*c^4*d^2*g^4*i^3) + x^2*(3*a^7
*d^6*g^4*i^3 + 9*a*b^6*c^6*g^4*i^3 + 6*a^6*b*c*d^5*g^4*i^3 - 18*a^2*b^5*c^5
*d*g^4*i^3 - 15*a^3*b^4*c^4*d^2*g^4*i^3 + 60*a^4*b^3*c^3*d^3*g^4*i^3 - 45*a
^5*b^2*c^2*d^4*g^4*i^3) + x^3*(3*b^7*c^6*g^4*i^3 + 9*a^6*b*d^6*g^4*i^3 + 6*
a*b^6*c^5*d*g^4*i^3 - 18*a^5*b^2*c*d^5*g^4*i^3 - 45*a^2*b^5*c^4*d^2*g^4*i^3
 + 60*a^3*b^4*c^3*d^3*g^4*i^3 - 15*a^4*b^3*c^2*d^4*g^4*i^3) + x^4*(9*a^5*b^
2*d^6*g^4*i^3 + 6*b^7*c^5*d*g^4*i^3 - 15*a*b^6*c^4*d^2*g^4*i^3 - 30*a^4*b^3
*c*d^5*g^4*i^3 + 30*a^3*b^4*c^2*d^4*g^4*i^3) + 3*a^3*b^4*c^6*g^4*i^3 + 3*a^
7*c^2*d^4*g^4*i^3 - 12*a^4*b^3*c^5*d*g^4*i^3 - 12*a^6*b*c^3*d^3*g^4*i^3 + 1
8*a^5*b^2*c^4*d^2*g^4*i^3))) + log(e*((a + b*x)/(c + d*x))^n)^2*((x*((5*B^2
*(2*a*b*d^2 + b^2*c*d)*(a*d + b*c))/(3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) -
 (5*B^2*b*d)/(6*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (5*B^2*a*b^2*c*d^2)/(a^2
*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + x^2*((5*B^2*b*d*(2*a*b*d^2 + b^2*c*d))/(3*
(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2) + (5*B^2*b^2*d^2*(a*d + b*c))/(a^2*d^2 +
 b^2*c^2 - 2*a*b*c*d)^2) - (B^2*(3*a*d + 2*b*c))/(6*(a^2*d^2 + b^2*c^2 - 2*
a*b*c*d)) + (5*B^2*a*c*(2*a*b*d^2 + b^2*c*d))/(3*(a^2*d^2 + b^2*c^2 - 2*a*b
*c*d)^2) + (5*B^2*b^3*d^3*x^3)/(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)^2)/(x*(2*a^3
*c*d*g^4*i^3 + 3*a^2*b*c^2*g^4*i^3) + x^2*(a^3*d^2*g^4*i^3 + 3*a*b^2*c^2*g^
4*i^3 + 6*a^2*b*c*d*g^4*i^3) + x^3*(b^3*c^2*g^4*i^3 + 3*a^2*b*d^2*g^4*i^3 +
 6*a*b^2*c*d*g^4*i^3) + x^4*(2*b^3*c*d*g^4*i^3 + 3*a*b^2*d^2*g^4*i^3) + a^3
*c^2*g^4*i^3 + b^3*d^2*g^4*i^3*x^5) - (10*B*b^2*d^3*(3*A + B*n))/(3*g^4*i^3
n(a*d - b*c)^6) + (10*B^2*b^2*d^3*(x^2*((g^4*i^3*n*(a*d + b*c)^2*(a*d - b
*c))/d + 2*a*b*c*g^4*i^3*n*(a*d - b*c)) + b^2*d*g^4*i^3*n*x^4*(a*d - b*c) +
 (a^2*c^2*g^4*i^3*n*(a*d - b*c))/d + 2*b*g^4*i^3*n*x^3*(a*d + b*c)*(a*d - b
*c) + (2*a*c*g^4*i^3*n*x*(a*d + b*c)*(a*d - b*c))/d))/(g^4*i^3*n*(a*d - b*c
)^6*(x*(2*a^3*c*d*g^4*i^3 + 3*a^2*b*c^2*g^4*i^3) + x^2*(a^3*d^2*g^4*i^3 + 3
*a*b^2*c^2*g^4*i^3 + 6*a^2*b*c*d*g^4*i^3) + x^3*(b^3*c^2*g^4*i^3 + 3*a^2*b*
d^2*g^4*i^3 + 6*a*b^2*c*d*g^4*i^3) + x^4*(2*b^3*c*d*g^4*i^3 + 3*a*b^2*d^2*g
^4*i^3) + a^3*c^2*g^4*i^3 + b^3*d^2*g^4*i^3*x^5))) + ((36*A^2*b^4*c^4 - 54*
A^2*a^4*d^4 - 27*B^2*a^4*d^4*n^2 + 8*B^2*b^4*c^4*n^2 + 846*A^2*a^2*b^2*c^2*
d^2 - 234*A^2*a*b^3*c^3*d + 486*A^2*a^3*b*c*d^3 + 54*A*B*a^4*d^4*n + 24*A*B
*b^4*c^4*n - 127*B^2*a*b^3*c^3*d*n^2 + 1053*B^2*a^3*b*c*d^3*n^2 + 2033*B^2*
a^2*b^2*c^2*d^2*n^2 + 1914*A*B*a^2*b^2*c^2*d^2*n - 246*A*B*a*b^3*c^3*d*n -
1026*A*B*a^3*b*c*d^3*n)/(6*(a*d - b*c)) + (5*x*(54*A^2*a^3*b*d^4 - 18*A^2*b
^4*c^3*d + 198*A^2*a*b^3*c^2*d^2 + 630*A^2*a^2*b^2*c*d^3 + 189*B^2*a^3*b*d^
4*n^2 - 19*B^2*b^4*c^3*d*n^2 - 162*A*B*a^3*b*d^4*n - 30*A*B*b^4*c^3*d*n + 7
37*B^2*a*b^3*c^2*d^2*n^2 + 1445*B^2*a^2*b^2*c*d^3*n^2 + 618*A*B*a*b^3*c^2*d
^2*n + 150*A*B*a^2*b^2*c*d^3*n))/(6*(a*d - b*c)...

3.210 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p$

Optimal. Leaf size=189

$$\frac{e^{-\frac{A(1+m)}{Bn}}(a+bx)(g(a+bx))^m\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{1+m}{n}}(i(c+dx))^{-m}\Gamma\left(1+p,-\frac{(1+m)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)(A+B\,\mathrm{lo}}{(bc-ad)i^2(1+m)(c+dx)}$$

```
[Out] (b*x+a)*(g*(b*x+a))^m*GAMMA(1+p,-(1+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)
*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p/(-a*d+b*c)/exp(A*(1+m)/B/n)/i^2/(1+m)/((
e*((b*x+a)/(d*x+c))^n)^((1+m)/n))/(d*x+c)/((i*(d*x+c))^m)/((-(1+m)*(A+B*ln(
e*((b*x+a)/(d*x+c))^n))/B/n)^p)
```

Rubi [A]
time = 0.21, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {2563, 2347, 2212}

$$\frac{(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^p\left(-\frac{(m+1)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{Bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{Bn}\right)}{i^2(m+1)(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^p,x]
```

```
[Out] ((a + b*x)*(g*(a + b*x))^m*Gamma[1 + p, -(((1 + m)*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(B*n))]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^p)/((b*c - a
*d)*E^((A*(1 + m))/(B*n))*i^2*(1 + m)*(e*((a + b*x)/(c + d*x))^n)^((1 + m)/
n)*(c + d*x)*(i*(c + d*x))^m*(-(((1 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(B*n)))^p)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int (210c+210dx)^{-2-m}(ag+bgx)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p\,dx=\int (210c+210dx)^{-2-m}(ag+bgx)^m$$

Mathematica [F]
time = 0.35, size = 0, normalized size = 0.00

$$\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^p,x]
```

```
[Out] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^p, x]
```

Maple [F]
time = 0.31, size = 0, normalized size = 0.00

$$\int (bgx+ag)^m\,(dix+ci)^{-2-m}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^m*(I*d*x + I*c)^(-m - 2)*(B*log(((b*x + a)/(d*x + c
))^n*e) + A)^p, x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="fricas")
```

```
[Out] integral((B*n*log((b*x + a)/(d*x + c)) + A + B)^p*(I*d*x + I*c)^(-m - 2)*e^
(m*log(I*d*x + I*c) + m*log(-I*g) + m*log((b*x + a)/(d*x + c))), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**p,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^m*(I*d*x + I*c)^(-m - 2)*(B*log(((b*x + a)/(d*x + c
))^n*e) + A)^p, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^m\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^p}{{\left(c\,i+d\,i\,x\right)}^{m+2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^p)/(c*i + d*i*x
)^(m + 2),x)
```

```
[Out] int(((a*g + b*g*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^p)/(c*i + d*i*x
)^(m + 2), x)
```

3.211 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p$

Optimal. Leaf size=190

$$-\frac{e^{\frac{A(1+m)}{Bn}}(a+bx)(g(a+bx))^{-2-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1+m}{n}}(i(c+dx))^{2+m}\Gamma\left(1+p,\frac{(1+m)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)(A+B}{(bc-ad)i^2(1+m)(c+dx)}$$

```
[Out] -exp(A*(1+m)/B/n)*(b*x+a)*(g*(b*x+a))^(-2-m)*(e*((b*x+a)/(d*x+c))^n)^((1+m)
/n)*(i*(d*x+c))^(2+m)*GAMMA(1+p,(1+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)*
(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p/(-a*d+b*c)/i^2/(1+m)/(d*x+c)/(((1+m)*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))/B/n)^p)
```

Rubi [A]

time = 0.20, antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {2563, 2347, 2212}

$$-\frac{(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^p\left(\frac{(m+1)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{Bn}\right)^{-p}\text{Gamma}\left(p+1,\frac{(m+1)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{Bn}\right)}{i^2(m+1)(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^p,x]
```

```
[Out] -((E^((A*(1 + m))/(B*n))*(a + b*x)*(g*(a + b*x))^(-2 - m)*(e*((a + b*x)/(c
+ d*x))^n)^((1 + m)/n)*(i*(c + d*x))^(2 + m)*Gamma[1 + p, ((1 + m)*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/(B*n)]*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^p)/((b*c - a*d)*i^2*(1 + m)*(c + d*x)*(((1 + m)*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(B*n))^p))
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int (211c+211dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p\,dx=\int (211c+211dx)^m(ag+bgx)^{-2-m}$$

Mathematica [F]
time = 0.34, size = 0, normalized size = 0.00

$$\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^p,x]
```

```
[Out] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^p, x]
```

Maple [F]
time = 0.28, size = 0, normalized size = 0.00

$$\int (bgx+ag)^{-2-m}\,(dix+ci)^m\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(I*d*x + I*c)^m*(B*log(((b*x + a)/(d*x + c
))^n*e) + A)^p, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="fricas")
```

```
[Out] integral((B*n*log((b*x + a)/(d*x + c)) + A + B)^p*(I*d*x + I*c)^m*e^(-(m +
2)*log(I*d*x + I*c) - (m + 2)*log(-I*g) - (m + 2)*log((b*x + a)/(d*x + c)))
, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**p,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(I*d*x + I*c)^m*(B*log(((b*x + a)/(d*x + c
))^n*e) + A)^p, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^m\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^p}{{\left(a\,g+b\,g\,x\right)}^{m+2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^p)/(a*g + b*g*x
)^(m + 2),x)
```

```
[Out] int(((c*i + d*i*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^p)/(a*g + b*g*x
)^(m + 2), x)
```

3.212 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3$

Optimal. Leaf size=292

$$-\frac{6B^3n^3(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{(bc-ad)i^2(1+m)^4(c+dx)}+\frac{6B^2n^2(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{(bc-ad)i^2(1+m)^3(c+dx)}$$

```
[Out] -6*B^3*n^3*(b*x+a)*(g*(b*x+a))^m/(-a*d+b*c)/i^2/(1+m)^4/(d*x+c)/((i*(d*x+c)
)^m)+6*B^2*n^2*(b*x+a)*(g*(b*x+a))^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+
b*c)/i^2/(1+m)^3/(d*x+c)/((i*(d*x+c))^m)-3*B*n*(b*x+a)*(g*(b*x+a))^m*(A+B*l
n(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)/i^2/(1+m)^2/(d*x+c)/((i*(d*x+c))^m)+
(b*x+a)*(g*(b*x+a))^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3/(-a*d+b*c)/i^2/(1+m
)/(d*x+c)/((i*(d*x+c))^m)
```

Rubi [A]

time = 0.22, antiderivative size = 292, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {2563, 2342, 2341}

$$\frac{6B^2n^2(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)^3(c+dx)(bc-ad)}+\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{i^2(m+1)(c+dx)(bc-ad)}-\frac{3Bn(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^2(m+1)^2(c+dx)(bc-ad)}-\frac{6B^3n^3(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{i^2(m+1)^4(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^3,x]
```

```
[Out] (-6*B^3*n^3*(a + b*x)*(g*(a + b*x))^m)/((b*c - a*d)*i^2*(1 + m)^4*(c + d*x)
*(i*(c + d*x))^m) + (6*B^2*n^2*(a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/((b*c - a*d)*i^2*(1 + m)^3*(c + d*x)*(i*(c + d*x))^m)
 - (3*B*n*(a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2)/((b*c - a*d)*i^2*(1 + m)^2*(c + d*x)*(i*(c + d*x))^m) + ((a + b*x)*(g*(a
 + b*x))^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/((b*c - a*d)*i^2*(1 +
m)*(c + d*x)*(i*(c + d*x))^m)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int (212c+212dx)^{-2-m}(ag+bgx)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3\,dx = \int \left(A^3(212c+212dx)^{-2-m}(ag+b\right.$$

$$= A^3\int (212c+212dx)^{-2-m}(ag+bgx$$

$$= \frac{A^3(212c+212dx)^{-1-m}(ag+bgx)^{1}}{212(bc-ad)g(1+m)}$$

$$= \frac{A^3(212c+212dx)^{-1-m}(ag+bgx)^{1}}{212(bc-ad)g(1+m)}$$

$$= -\frac{3\ 212^{-2-m}A^2Bn(c+dx)^{-1-m}(ag}{(bc-ad)g(1+m)^2}$$

Mathematica [A]
time = 4.26, size = 206, normalized size = 0.71

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-1-m}\left(A^3(1+m)^3-3A^2B(1+m)^2n+6AB^2(1+m)n^2-6B^3n^3+3B(1+m)\left(A^2(1+m)^2-2AB(1+m)n+2B^2n^2\right)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3B^2(1+m)^2(A+Am-Bn)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+B^3(1+m)^3\log^3\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)i(1+m)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^3,x]
```

```
[Out] ((a + b*x)*(g*(a + b*x))^m*(i*(c + d*x))^(-1 - m)*(A^3*(1 + m)^3 - 3*A^2*B*
(1 + m)^2*n + 6*A*B^2*(1 + m)*n^2 - 6*B^3*n^3 + 3*B*(1 + m)*(A^2*(1 + m)^2
- 2*A*B*(1 + m)*n + 2*B^2*n^2)*Log[e*((a + b*x)/(c + d*x))^n] + 3*B^2*(1 +
m)^2*(A + A*m - B*n)*Log[e*((a + b*x)/(c + d*x))^n]^2 + B^3*(1 + m)^3*Log[e
*((a + b*x)/(c + d*x))^n]^3))/((b*c - a*d)*i*(1 + m)^4)
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int (bgx+ag)^m\,(dix+ci)^{-2-m}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^3*(b*g*x + a*g)^m*(I*d*x +
 I*c)^(-m - 2), x)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2063 vs. 2(288) = 576.
time = 0.49, size = 2063, normalized size = 7.07

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] -(6*B^3*a*c*n^3 - (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*c*m^3 - 3*(A^3 + 3*A^2*
B + 3*A*B^2 + B^3)*a*c*m^2 - 3*(A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*c*m - ((B^
3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^3*x^2 + (B^3*b*c + B^3
*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B
^3*a*d)*m)*n^3*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n^
3)*log((b*x + a)/(d*x + c))^3 - (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*c - 6*((A
*B^2 + B^3)*a*c*m + (A*B^2 + B^3)*a*c)*n^2 + (6*B^3*b*d*n^3 - (A^3 + 3*A^2*
B + 3*A*B^2 + B^3)*b*d*m^3 - 3*(A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*d*m^2 - 3*
(A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*d*m - (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*d
 - 6*((A*B^2 + B^3)*b*d*m + (A*B^2 + B^3)*b*d)*n^2 + 3*((A^2*B + 2*A*B^2 +
B^3)*b*d*m^2 + 2*(A^2*B + 2*A*B^2 + B^3)*b*d*m + (A^2*B + 2*A*B^2 + B^3)*b*
d)*n)*x^2 + 3*((B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n^3 - ((A*B^2 + B^3)*a
*c*m^3 + 3*(A*B^2 + B^3)*a*c*m^2 + 3*(A*B^2 + B^3)*a*c*m + (A*B^2 + B^3)*a*
c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n^3 - ((A*B^2 + B^3)*b*d*m^
3 + 3*(A*B^2 + B^3)*b*d*m^2 + 3*(A*B^2 + B^3)*b*d*m + (A*B^2 + B^3)*b*d)*n^
2)*x^2 + ((B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a
*d)*m)*n^3 - (((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d)*m^3 + (A*B^2 + B^3)*b
*c + (A*B^2 + B^3)*a*d + 3*((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d)*m^2 + 3*
```

```
((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d)*m)*n^2)*x)*log((b*x + a)/(d*x + c))
^2 + 3*((A^2*B + 2*A*B^2 + B^3)*a*c*m^2 + 2*(A^2*B + 2*A*B^2 + B^3)*a*c*m +
 (A^2*B + 2*A*B^2 + B^3)*a*c)*n - (((A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*c + (
A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*d)*m^3 - 6*(B^3*b*c + B^3*a*d)*n^3 + (A^3
+ 3*A^2*B + 3*A*B^2 + B^3)*b*c + (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*d + 3*((
A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*c + (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*d)*m
^2 + 6*((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d + ((A*B^2 + B^3)*b*c + (A*B^2
 + B^3)*a*d)*m)*n^2 + 3*((A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*c + (A^3 + 3*A^2
*B + 3*A*B^2 + B^3)*a*d)*m - 3*((A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*
B^2 + B^3)*a*d + ((A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d
)*m^2 + 2*((A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d)*m)*n)
*x - 3*(2*(B^3*a*c*m + B^3*a*c)*n^3 - 2*((A*B^2 + B^3)*a*c*m^2 + 2*(A*B^2 +
 B^3)*a*c*m + (A*B^2 + B^3)*a*c)*n^2 + (2*(B^3*b*d*m + B^3*b*d)*n^3 - 2*((A
*B^2 + B^3)*b*d*m^2 + 2*(A*B^2 + B^3)*b*d*m + (A*B^2 + B^3)*b*d)*n^2 + ((A^
2*B + 2*A*B^2 + B^3)*b*d*m^3 + 3*(A^2*B + 2*A*B^2 + B^3)*b*d*m^2 + 3*(A^2*B
 + 2*A*B^2 + B^3)*b*d*m + (A^2*B + 2*A*B^2 + B^3)*b*d)*n)*x^2 + ((A^2*B + 2
*A*B^2 + B^3)*a*c*m^3 + 3*(A^2*B + 2*A*B^2 + B^3)*a*c*m^2 + 3*(A^2*B + 2*A*
B^2 + B^3)*a*c*m + (A^2*B + 2*A*B^2 + B^3)*a*c)*n + (2*(B^3*b*c + B^3*a*d +
 (B^3*b*c + B^3*a*d)*m)*n^3 - 2*((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d + ((
A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d)*m^2 + 2*((A*B^2 + B^3)*b*c + (A*B^2 +
 B^3)*a*d)*m)*n^2 + (((A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)
*a*d)*m^3 + (A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d + 3*(
(A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d)*m^2 + 3*((A^2*B
+ 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d)*m)*n)*x)*log((b*x + a)/
(d*x + c)))*(I*d*x + I*c)^(-m - 2)*e^(m*log(I*d*x + I*c) + m*log(-I*g) + m*
log((b*x + a)/(d*x + c)))/((b*c - a*d)*m^4 + 4*(b*c - a*d)*m^3 + 6*(b*c - a
*d)*m^2 + b*c - a*d + 4*(b*c - a*d)*m)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^3*(b*g*x + a*g)^m*(I*d*x +
 I*c)^(-m - 2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^m\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^3}{(c\,i+d\,i\,x)^{m+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^3)/(c*i + d*i*x
)^(m + 2),x)
```

```
[Out] int(((a*g + b*g*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^3)/(c*i + d*i*x
)^(m + 2), x)
```

3.213 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2$

Optimal. Leaf size=210

$$\frac{2B^2n^2(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{(bc-ad)i^2(1+m)^3(c+dx)}-\frac{2Bn(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)i^2(1+m)^2(c+dx)}$$

```
[Out] 2*B^2*n^2*(b*x+a)*(g*(b*x+a))^m/(-a*d+b*c)/i^2/(1+m)^3/(d*x+c)/((i*(d*x+c))
^m)-2*B*n*(b*x+a)*(g*(b*x+a))^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)/
i^2/(1+m)^2/(d*x+c)/((i*(d*x+c))^m)+(b*x+a)*(g*(b*x+a))^m*(A+B*ln(e*((b*x+a
)/(d*x+c))^n))^2/(-a*d+b*c)/i^2/(1+m)/(d*x+c)/((i*(d*x+c))^m)
```

Rubi [A]

time = 0.17, antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {2563, 2342, 2341}

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^2(m+1)(c+dx)(bc-ad)}-\frac{2Bn(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)^2(c+dx)(bc-ad)}+\frac{2B^2n^2(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{i^2(m+1)^3(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2,x]
```

```
[Out] (2*B^2*n^2*(a + b*x)*(g*(a + b*x))^m)/((b*c - a*d)*i^2*(1 + m)^3*(c + d*x)*
(i*(c + d*x))^m) - (2*B*n*(a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/((b*c - a*d)*i^2*(1 + m)^2*(c + d*x)*(i*(c + d*x))^m) + ((
a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c -
a*d)*i^2*(1 + m)*(c + d*x)*(i*(c + d*x))^m)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int (213c+213dx)^{-2-m}(ag+bgx)^m \left(A+B\log \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \Big(A^2(213c+213dx)^{-2-m}(ag+$$

$$= A^2 \int (213c+213dx)^{-2-m}(ag+bg$$

$$= \frac{A^2(213c+213dx)^{-1-m}(ag+bgx)}{213(bc-ad)g(1+m)}$$

$$= \frac{A^2(213c+213dx)^{-1-m}(ag+bgx)}{213(bc-ad)g(1+m)}$$

$$= -\frac{2\ 213^{-2-m}ABn(c+dx)^{-1-m}(ag}{(bc-ad)g(1+m)^2}$$

Mathematica [A]
time = 1.32, size = 134, normalized size = 0.64

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-1-m}\left(A^2(1+m)^2-2AB(1+m)n+2B^2n^2+2B(1+m)(A+Am-Bn)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+B^2(1+m)^2\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)i(1+m)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2,x]
```

```
[Out] ((a + b*x)*(g*(a + b*x))^m*(i*(c + d*x))^(-1 - m)*(A^2*(1 + m)^2 - 2*A*B*(1
 + m)*n + 2*B^2*n^2 + 2*B*(1 + m)*(A + A*m - B*n)*Log[e*((a + b*x)/(c + d*x
))^n] + B^2*(1 + m)^2*Log[e*((a + b*x)/(c + d*x))^n]^2))/((b*c - a*d)*i*(1
+ m)^3)
```

Maple [F]
time = 0.21, size = 0, normalized size = 0.00

$$\int (bgx+ag)^m (dix+ci)^{-2-m} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="maxima")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^2*(b*g*x + a*g)^m*(I*d*x +
 I*c)^(-m - 2), x)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 799 vs. 2(207) = 414.
time = 0.40, size = 799, normalized size = 3.80

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="fricas")
```

```
[Out] (2*B^2*a*c*n^2 + (A^2 + 2*A*B + B^2)*a*c*m^2 + 2*(A^2 + 2*A*B + B^2)*a*c*m
+ (A^2 + 2*A*B + B^2)*a*c + (2*B^2*b*d*n^2 + (A^2 + 2*A*B + B^2)*b*d*m^2 +
2*(A^2 + 2*A*B + B^2)*b*d*m + (A^2 + 2*A*B + B^2)*b*d - 2*((A*B + B^2)*b*d*
m + (A*B + B^2)*b*d)*n)*x^2 + ((B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*n^2*x^
2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m)
*n^2*x + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c)*n^2)*log((b*x + a)/(d*x + c)
)^2 - 2*((A*B + B^2)*a*c*m + (A*B + B^2)*a*c)*n + ((A^2 + 2*A*B + B^2)*b*c
+ (A^2 + 2*A*B + B^2)*a*d + ((A^2 + 2*A*B + B^2)*b*c + (A^2 + 2*A*B + B^2)*
a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*n^2 + 2*((A^2 + 2*A*B + B^2)*b*c + (A^2 +
2*A*B + B^2)*a*d)*m - 2*((A*B + B^2)*b*c + (A*B + B^2)*a*d + ((A*B + B^2)*b
*c + (A*B + B^2)*a*d)*m)*n)*x - 2*((B^2*a*c*m + B^2*a*c)*n^2 + ((B^2*b*d*m
+ B^2*b*d)*n^2 - ((A*B + B^2)*b*d*m^2 + 2*(A*B + B^2)*b*d*m + (A*B + B^2)*b
*d)*n)*x^2 - ((A*B + B^2)*a*c*m^2 + 2*(A*B + B^2)*a*c*m + (A*B + B^2)*a*c)*
n + ((B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m)*n^2 - ((A*B + B^2)*b*c + (
A*B + B^2)*a*d + ((A*B + B^2)*b*c + (A*B + B^2)*a*d)*m^2 + 2*((A*B + B^2)*b
*c + (A*B + B^2)*a*d)*m)*n)*x)*log((b*x + a)/(d*x + c)))*(I*d*x + I*c)^(-m
- 2)*e^(m*log(I*d*x + I*c) + m*log(-I*g) + m*log((b*x + a)/(d*x + c)))/((b*
c - a*d)*m^3 + 3*(b*c - a*d)*m^2 + b*c - a*d + 3*(b*c - a*d)*m)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^2*(b*g*x + a*g)^m*(I*d*x +
 I*c)^(-m - 2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^m\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{{\left(c\,i+d\,i\,x\right)}^{m+2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^(m + 2),x)
```

```
[Out] int(((a*g + b*g*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(c*i + d*i*x
)^(m + 2), x)
```

3.214 $\int (ag+bgx)^m(ci+dix)^{-2-m} \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) d$

Optimal. Leaf size=128

$$-\frac{Bn(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{(bc-ad)i^2(1+m)^2(c+dx)}+\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)i^2(1+m)(c+dx)}$$

```
[Out] -B*n*(b*x+a)*(g*(b*x+a))^m/(-a*d+b*c)/i^2/(1+m)^2/(d*x+c)/((i*(d*x+c))^m)+(
b*x+a)*(g*(b*x+a))^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)/i^2/(1+m)/(
d*x+c)/((i*(d*x+c))^m)
```

Rubi [A]
time = 0.11, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$, Rules used = {2563, 2341}

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)(c+dx)(bc-ad)}-\frac{Bn(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{i^2(m+1)^2(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]),x]
```

```
[Out] -((B*n*(a + b*x)*(g*(a + b*x))^m)/((b*c - a*d)*i^2*(1 + m)^2*(c + d*x)*(i*(
c + d*x))^m)) + ((a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/((b*c - a*d)*i^2*(1 + m)*(c + d*x)*(i*(c + d*x))^m)
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int (214c+214dx)^{-2-m}(ag+bgx)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx=\int\left(A(214c+214dx)^{-2-m}(ag+bg\right.$$
$$=A\int(214c+214dx)^{-2-m}(ag+bgx$$
$$=\frac{A(214c+214dx)^{-1-m}(ag+bgx)^{1+}}{214(bc-ad)g(1+m)}$$
$$=\frac{A(214c+214dx)^{-1-m}(ag+bgx)^{1+}}{214(bc-ad)g(1+m)}$$
$$=-\frac{214^{-2-m}Bn(c+dx)^{-1-m}(ag+b}{(bc-ad)g(1+m)^2}$$

Mathematica [A]
time = 0.34, size = 78, normalized size = 0.61

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-1-m}\left(A+Am-Bn+B(1+m)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)i(1+m)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]),x]
```

```
[Out] ((a + b*x)*(g*(a + b*x))^m*(i*(c + d*x))^(-1 - m)*(A + A*m - B*n + B*(1 + m
)*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*i*(1 + m)^2)
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int (bgx+ag)^m(dix+ci)^{-2-m}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="maxima")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)*(b*g*x + a*g)^m*(I*d*x + I
*c)^(-m - 2), x)
```

Fricas [A]
time = 0.41, size = 235, normalized size = 1.84

$$\frac{((A+B)acm - Bacn + (A+B)ac + ((A+B)bdm - Bbdn + (A+B)bd)x^2 + ((A+B)bc + (A+B)ad + ((A+B)bc + (A+B)ad)m - (Bbc + Bad)n)x + ((Bbdm + Bbd)nx^2 + (Bbc + Bad + (Bbc + Bad)m)nx + (Bacm + Bac)n)\log\left(\frac{bx+a}{dx+c}\right))(i\,dx + i\,c)^{-m-2}e^{\left(m\log(i\,dx+i\,c)+m\log(-i\,g)+m\log\left(\frac{bx+a}{dx+c}\right)\right)}}{(bc-ad)m^2 + bc - ad + 2\,(bc-ad)m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="fricas")
```

```
[Out] ((A + B)*a*c*m - B*a*c*n + (A + B)*a*c + ((A + B)*b*d*m - B*b*d*n + (A + B)
*b*d)*x^2 + ((A + B)*b*c + (A + B)*a*d + ((A + B)*b*c + (A + B)*a*d)*m - (B
*b*c + B*a*d)*n)*x + ((B*b*d*m + B*b*d)*n*x^2 + (B*b*c + B*a*d + (B*b*c + B
*a*d)*m)*n*x + (B*a*c*m + B*a*c)*n)*log((b*x + a)/(d*x + c)))*(I*d*x + I*c)
^(-m - 2)*e^(m*log(I*d*x + I*c) + m*log(-I*g) + m*log((b*x + a)/(d*x + c)))
/((b*c - a*d)*m^2 + b*c - a*d + 2*(b*c - a*d)*m)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n
)),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)*(b*g*x + a*g)^m*(I*d*x + I
*c)^(-m - 2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^m\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{{\left(c\,i+d\,i\,x\right)}^{m+2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
(m + 2),x)
```

```
[Out] int(((a*g + b*g*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(c*i + d*i*x)^
(m + 2), x)
```

3.215 $\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=125

$$\frac{e^{-\frac{A(1+m)}{Bn}}(a+bx)(g(a+bx))^m\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{1+m}{n}}(i(c+dx))^{-m}\text{Ei}\left(\frac{(1+m)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B(bc-ad)i^2n(c+dx)}$$

```
[Out] (b*x+a)*(g*(b*x+a))^m*Ei((1+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)/B/(-a*d
+b*c)/exp(A*(1+m)/B/n)/i^2/n/((e*((b*x+a)/(d*x+c))^n)^((1+m)/n))/(d*x+c)/((
i*(d*x+c))^m)
```

Rubi [A]
time = 0.19, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {2563, 2347, 2209}

$$\frac{(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}}\text{Ei}\left(\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bi^2n(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/(c + d
*x))^n]),x]
```

```
[Out] ((a + b*x)*(g*(a + b*x))^m*ExpIntegralEi[((1 + m)*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(B*n)])/(B*(b*c - a*d)*E^((A*(1 + m))/(B*n))*i^2*n*(e*((a +
b*x)/(c + d*x))^n)^((1 + m)/n)*(c + d*x)*(i*(c + d*x))^m)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int \frac{(215c+215dx)^{-2-m}(ag+bgx)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx=\int \frac{(215c+215dx)^{-2-m}(ag+bgx)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Mathematica [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n]),x]
```

```
[Out] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n]), x]
```

Maple [F]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^m\,(dix+ci)^{-2-m}}{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^m*(I*d*x + I*c)^(-m - 2)/(B*log(((b*x + a)/(d*x + c
))^n*e) + A), x)
```

Fricas [A]
time = 0.39, size = 83, normalized size = 0.66

$$-\frac{\operatorname{Ei}\left(\frac{(Bm+B)n\log\left(\frac{bx+a}{dx+c}\right)+(A+B)m+A+B}{Bn}\right)e^{\left(\frac{Bmn\log(-i\,g)-(A+B)m-A-B}{Bn}\right)}}{(Bbc-Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="fricas")
```

```
[Out] -Ei(((B*m + B)*n*log((b*x + a)/(d*x + c)) + (A + B)*m + A + B)/(B*n))*e^((B
*m*n*log(-I*g) - (A + B)*m - A - B)/(B*n))/((B*b*c - B*a*d)*n)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))**n
)),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6439 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^m*(I*d*x + I*c)^(-m - 2)/(B*log(((b*x + a)/(d*x + c
))^n*e) + A), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a\,g+b\,g\,x)^m}{(c\,i+d\,i\,x)^{m+2}\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^m/((c*i + d*i*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))),x)
```

```
[Out] int((a*g + b*g*x)^m/((c*i + d*i*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))), x)
```

3.216 $\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=206

$$\frac{e^{-\frac{A(1+m)}{Bn}}(1+m)(a+bx)(g(a+bx))^m\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{1+m}{n}}(i(c+dx))^{-m}\text{Ei}\left(\frac{(1+m)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2(bc-ad)i^2n^2(c+dx)}-\frac{(a}{B(bc-}$$

[Out] (1+m)*(b*x+a)*(g*(b*x+a))^m*Ei((1+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)/B^2/(-a*d+b*c)/exp(A*(1+m)/B/n)/i^2/n^2/((e*((b*x+a)/(d*x+c))^n)^((1+m)/n))/(d*x+c)/((i*(d*x+c))^m)-(b*x+a)*(g*(b*x+a))^m/B/(-a*d+b*c)/i^2/n/(d*x+c)/((i*(d*x+c))^m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))

Rubi [A]

time = 0.22, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.082$, Rules used = {2563, 2343, 2347, 2209}

$$\frac{(m+1)(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}}\text{Ei}\left(\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2i^2n^2(c+dx)(bc-ad)}-\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{Bi^2n(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

Antiderivative was successfully verified.

[In] Int[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]

[Out] ((1 + m)*(a + b*x)*(g*(a + b*x))^m*ExpIntegralEi[((1 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(B*n)])/(B^2*(b*c - a*d)*E^((A*(1 + m))/(B*n))*i^2*n^2*(e*((a + b*x)/(c + d*x))^n)^((1 + m)/n)*(c + d*x)*(i*(c + d*x))^m) - ((a + b*x)*(g*(a + b*x))^m)/(B*(b*c - a*d)*i^2*n*(c + d*x)*(i*(c + d*x))^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^(p + 1)/(b*d*n*(p + 1))), x] - Dist[(m + 1)/(b*n*(p + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p + 1), x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1] && LtQ[p, -1]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int \frac{(216c+216dx)^{-2-m}(ag+bgx)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{(216c+216dx)^{-2-m}(ag+bgx)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2,x]
```

```
[Out] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2, x]
```

Maple [F]
time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^m\,(dix+ci)^{-2-m}}{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="maxima")
```

```
[Out] g^m*(m + 1)*integrate(-(b*x + a)^m/(((-1)^(1/2*m)*B^2*d^2*n*x^2 + 2*(-1)^(1
/2*m)*B^2*c*d*n*x + (-1)^(1/2*m)*B^2*c^2*n)*(d*x + c)^m*log((b*x + a)^n) -
((-1)^(1/2*m)*B^2*d^2*n*x^2 + 2*(-1)^(1/2*m)*B^2*c*d*n*x + (-1)^(1/2*m)*B^2
*c^2*n)*(d*x + c)^m*log((d*x + c)^n) + ((-1)^(1/2*m)*A*B*c^2*n + (-1)^(1/2*
m)*B^2*c^2*n + ((-1)^(1/2*m)*A*B*d^2*n + (-1)^(1/2*m)*B^2*d^2*n)*x^2 + 2*((
-1)^(1/2*m)*A*B*c*d*n + (-1)^(1/2*m)*B^2*c*d*n)*x)*(d*x + c)^m), x) + (b*g^
m*x + a*g^m)*(b*x + a)^m/((((-1)^(1/2*m)*b*c*d*n - (-1)^(1/2*m)*a*d^2*n)*B^
2*x + ((-1)^(1/2*m)*b*c^2*n - (-1)^(1/2*m)*a*c*d*n)*B^2)*(d*x + c)^m*log((b
*x + a)^n) - (((-1)^(1/2*m)*b*c*d*n - (-1)^(1/2*m)*a*d^2*n)*B^2*x + ((-1)^(
1/2*m)*b*c^2*n - (-1)^(1/2*m)*a*c*d*n)*B^2)*(d*x + c)^m*log((d*x + c)^n) +
(((-1)^(1/2*m)*b*c^2*n - (-1)^(1/2*m)*a*c*d*n)*A*B + ((-1)^(1/2*m)*b*c^2*n
- (-1)^(1/2*m)*a*c*d*n)*B^2 + (((-1)^(1/2*m)*b*c*d*n - (-1)^(1/2*m)*a*d^2*n
)*A*B + ((-1)^(1/2*m)*b*c*d*n - (-1)^(1/2*m)*a*d^2*n)*B^2)*x)*(d*x + c)^m)
```

Fricas [A]
time = 0.40, size = 240, normalized size = 1.17

$$-\frac{(Bbdnx^2 + Bacn + (Bbc + Bad)nx)(i\,dx + i\,c)^{-m-2}e^{\left(m\log(i\,dx+i\,c)+m\log(-i\,g)+m\log\left(\frac{bx+a}{dx+c}\right)\right)} + ((Bm + B)n\log\left(\frac{bx+a}{dx+c}\right) + (A + B)m + A + B)\operatorname{Ei}\left(\frac{(Bm+B)n\log\left(\frac{bx+a}{dx+c}\right)+(A+B)m+A+B}{Bn}\right)e^{\left(\frac{Bmn\log(-i\,g)-(A+B)m-A-B}{Bn}\right)}}{(B^3bc - B^3ad)n^3\log\left(\frac{bx+a}{dx+c}\right) + ((AB^2 + B^3)bc - (AB^2 + B^3)ad)n^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="fricas")
```

```
[Out] -((B*b*d*n*x^2 + B*a*c*n + (B*b*c + B*a*d)*n*x)*(I*d*x + I*c)^(-m - 2)*e^(m
*log(I*d*x + I*c) + m*log(-I*g) + m*log((b*x + a)/(d*x + c))) + ((B*m + B)*
n*log((b*x + a)/(d*x + c)) + (A + B)*m + A + B)*Ei(((B*m + B)*n*log((b*x +
a)/(d*x + c)) + (A + B)*m + A + B)/(B*n))*e^((B*m*n*log(-I*g) - (A + B)*m -
 A - B)/(B*n)))/((B^3*b*c - B^3*a*d)*n^3*log((b*x + a)/(d*x + c)) + ((A*B^2
 + B^3)*b*c - (A*B^2 + B^3)*a*d)*n^2)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6439 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^m*(I*d*x + I*c)^(-m - 2)/(B*log(((b*x + a)/(d*x + c
))^n*e) + A)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^m}{(c\,i+d\,i\,x)^{m+2}\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^m/((c*i + d*i*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))^2),x)
```

```
[Out] int((a*g + b*g*x)^m/((c*i + d*i*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))^2), x)
```

3.217 $\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$

Optimal. Leaf size=295

$$\frac{e^{-\frac{A(1+m)}{Bn}}(1+m)^2(a+bx)(g(a+bx))^m\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{1+m}{n}}(i(c+dx))^{-m}\text{Ei}\left(\frac{(1+m)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{2B^3(bc-ad)i^2n^3(c+dx)}-\frac{}{2B(bc-}$$

```
[Out] 1/2*(1+m)^2*(b*x+a)*(g*(b*x+a))^m*Ei((1+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/
B/n)/B^3/(-a*d+b*c)/exp(A*(1+m)/B/n)/i^2/n^3/((e*((b*x+a)/(d*x+c))^n)^((1+m
)/n))/(d*x+c)/((i*(d*x+c))^m)-1/2*(b*x+a)*(g*(b*x+a))^m/B/(-a*d+b*c)/i^2/n/
(d*x+c)/((i*(d*x+c))^m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2-1/2*(1+m)*(b*x+a)
*(g*(b*x+a))^m/B^2/(-a*d+b*c)/i^2/n^2/(d*x+c)/((i*(d*x+c))^m)/(A+B*ln(e*((b
*x+a)/(d*x+c))^n))
```

Rubi [A]

time = 0.26, antiderivative size = 295, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.082$, Rules used = {2563, 2343, 2347, 2209}

$$\frac{(m+1)^2(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}}\text{Ei}\left(\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{2B^3i^2n^3(c+dx)(bc-ad)}-\frac{(m+1)(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{2B^2i^2n^2(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}-\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{2Bi^2n(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^3,x]
```

```
[Out] ((1 + m)^2*(a + b*x)*(g*(a + b*x))^m*ExpIntegralEi[((1 + m)*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]))/(B*n)])/(2*B^3*(b*c - a*d)*E^((A*(1 + m))/(B*n))*i
^2*n^3*(e*((a + b*x)/(c + d*x))^n)^((1 + m)/n)*(c + d*x)*(i*(c + d*x))^m) -
 ((a + b*x)*(g*(a + b*x))^m)/(2*B*(b*c - a*d)*i^2*n*(c + d*x)*(i*(c + d*x))
^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) - ((1 + m)*(a + b*x)*(g*(a + b
*x))^m)/(2*B^2*(b*c - a*d)*i^2*n^2*(c + d*x)*(i*(c + d*x))^m*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^(p + 1)/(b*d*n*(p + 1))), x] -
```

```
Dist[(m + 1)/(b*n*(p + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p + 1), x], x]
/; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1] && LtQ[p, -1]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int \frac{(217c+217dx)^{-2-m}(ag+bgx)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx=\int \frac{(217c+217dx)^{-2-m}(ag+bgx)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Mathematica [F]
time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^3,x]
```

```
[Out] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^3, x]
```

Maple [F]
time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^m\,(dix+ci)^{-2-m}}{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] (m^2 + 2*m + 1)*g^m*integrate(-1/2*(b*x + a)^m/(((-1)^(1/2*m)*B^3*d^2*n^2*x
^2 + 2*(-1)^(1/2*m)*B^3*c*d*n^2*x + (-1)^(1/2*m)*B^3*c^2*n^2)*(d*x + c)^m*l
og((b*x + a)^n) - ((-1)^(1/2*m)*B^3*d^2*n^2*x^2 + 2*(-1)^(1/2*m)*B^3*c*d*n^
2*x + (-1)^(1/2*m)*B^3*c^2*n^2)*(d*x + c)^m*log((d*x + c)^n) + ((-1)^(1/2*m
)*A*B^2*c^2*n^2 + (-1)^(1/2*m)*B^3*c^2*n^2 + ((-1)^(1/2*m)*A*B^2*d^2*n^2 +
(-1)^(1/2*m)*B^3*d^2*n^2)*x^2 + 2*((-1)^(1/2*m)*A*B^2*c*d*n^2 + (-1)^(1/2*m
)*B^3*c*d*n^2)*x)*(d*x + c)^m), x) + 1/2*((B*b*g^m*(m + 1)*x + B*a*g^m*(m +
 1))*(b*x + a)^m*log((b*x + a)^n) - (B*b*g^m*(m + 1)*x + B*a*g^m*(m + 1))*(
b*x + a)^m*log((d*x + c)^n) + (B*a*g^m*(m + n + 1) + A*a*g^m*(m + 1) + (B*b
*g^m*(m + n + 1) + A*b*g^m*(m + 1))*x)*(b*x + a)^m)/((((-1)^(1/2*m)*b*c*d*n
^2 - (-1)^(1/2*m)*a*d^2*n^2)*B^4*x + ((-1)^(1/2*m)*b*c^2*n^2 - (-1)^(1/2*m)
*a*c*d*n^2)*B^4)*(d*x + c)^m*log((b*x + a)^n)^2 + (((-1)^(1/2*m)*b*c*d*n^2
- (-1)^(1/2*m)*a*d^2*n^2)*B^4*x + ((-1)^(1/2*m)*b*c^2*n^2 - (-1)^(1/2*m)*a*
c*d*n^2)*B^4)*(d*x + c)^m*log((d*x + c)^n)^2 + 2*(((-1)^(1/2*m)*b*c^2*n^2 -
 (-1)^(1/2*m)*a*c*d*n^2)*A*B^3 + ((-1)^(1/2*m)*b*c^2*n^2 - (-1)^(1/2*m)*a*c
*d*n^2)*B^4 + (((-1)^(1/2*m)*b*c*d*n^2 - (-1)^(1/2*m)*a*d^2*n^2)*A*B^3 + ((
-1)^(1/2*m)*b*c*d*n^2 - (-1)^(1/2*m)*a*d^2*n^2)*B^4)*x)*(d*x + c)^m*log((b*
x + a)^n) + (((-1)^(1/2*m)*b*c^2*n^2 - (-1)^(1/2*m)*a*c*d*n^2)*A^2*B^2 + 2*
((-1)^(1/2*m)*b*c^2*n^2 - (-1)^(1/2*m)*a*c*d*n^2)*A*B^3 + ((-1)^(1/2*m)*b*c
^2*n^2 - (-1)^(1/2*m)*a*c*d*n^2)*B^4 + (((-1)^(1/2*m)*b*c*d*n^2 - (-1)^(1/2
*m)*a*d^2*n^2)*A^2*B^2 + 2*((-1)^(1/2*m)*b*c*d*n^2 - (-1)^(1/2*m)*a*d^2*n^2
)*A*B^3 + ((-1)^(1/2*m)*b*c*d*n^2 - (-1)^(1/2*m)*a*d^2*n^2)*B^4)*x)*(d*x +
c)^m - 2*((((-1)^(1/2*m)*b*c*d*n^2 - (-1)^(1/2*m)*a*d^2*n^2)*B^4*x + ((-1)^
(1/2*m)*b*c^2*n^2 - (-1)^(1/2*m)*a*c*d*n^2)*B^4)*(d*x + c)^m*log((b*x + a)^
n) + (((-1)^(1/2*m)*b*c^2*n^2 - (-1)^(1/2*m)*a*c*d*n^2)*A*B^3 + ((-1)^(1/2*
m)*b*c^2*n^2 - (-1)^(1/2*m)*a*c*d*n^2)*B^4 + (((-1)^(1/2*m)*b*c*d*n^2 - (-1
)^(1/2*m)*a*d^2*n^2)*A*B^3 + ((-1)^(1/2*m)*b*c*d*n^2 - (-1)^(1/2*m)*a*d^2*n
^2)*B^4)*x)*(d*x + c)^m)*log((d*x + c)^n))
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 596 vs. $2(287) = 574$.

time = 0.40, size = 596, normalized size = 2.02

$$-\frac{\left(B^2acn^2+\left(B^2bdn^2+\left((AB+B^2)bdm+(AB+B^2)bd\right)n\right)x^2+\left((AB+B^2)acm+(AB+B^2)ac\right)n+\left((B^2bc+B^2ad)n^2+\left((AB+B^2)bc+(AB+B^2)ad+\left((AB+B^2)bc+(AB+B^2)ad\right)m\right)n\right)x+\left((B^2bdm+B^2bd)n^2x^2+\left(B^2bc+B^2ad+(B^2bc+B^2ad)m\right)n^2x+(B^2acm+B^2ac)n^2\right)\log\left(\frac{bx+a}{dx+c}\right)\right)(i\,dx+i\,c)^{-m-2}e^{\left(m\log(i\,dx+i\,c)+m\log(-i\,g)+m\log\left(\frac{bx+a}{dx+c}\right)\right)}+\left((B^2m^2+2\,B^2m+B^2)n^2\log\left(\frac{bx+a}{dx+c}\right)^2+(A^2+2\,AB+B^2)m^2+2\left((AB+B^2)m^2+AB+B^2+2\,(AB+B^2)m\right)n\log\left(\frac{bx+a}{dx+c}\right)+A^2+2\,AB+B^2+2\,(A^2+2\,AB+B^2)m\right)\mathrm{Ei}\left(\frac{(Bm+B)n\log\left(\frac{bx+a}{dx+c}\right)+(A+B)m+A+B}{Bn}\right)e^{\left(\frac{Bmn\log(-i\,g)-(A+B)m-A-B}{Bn}\right)}}{2\left((B^5bc-B^5ad)n^5\log\left(\frac{bx+a}{dx+c}\right)^2+2\left((AB^4+B^5)bc-(AB^4+B^5)ad\right)n^4\log\left(\frac{bx+a}{dx+c}\right)+\left((A^2B^3+2\,AB^4+B^5)bc-(A^2B^3+2\,AB^4+B^5)ad\right)n^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] -1/2*((B^2*a*c*n^2 + (B^2*b*d*n^2 + ((A*B + B^2)*b*d*m + (A*B + B^2)*b*d)*n
)*x^2 + ((A*B + B^2)*a*c*m + (A*B + B^2)*a*c)*n + ((B^2*b*c + B^2*a*d)*n^2
+ ((A*B + B^2)*b*c + (A*B + B^2)*a*d + ((A*B + B^2)*b*c + (A*B + B^2)*a*d)*
m)*n)*x + ((B^2*b*d*m + B^2*b*d)*n^2*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c +
B^2*a*d)*m)*n^2*x + (B^2*a*c*m + B^2*a*c)*n^2)*log((b*x + a)/(d*x + c)))*(I
*d*x + I*c)^(-m - 2)*e^(m*log(I*d*x + I*c) + m*log(-I*g) + m*log((b*x + a)/
(d*x + c))) + ((B^2*m^2 + 2*B^2*m + B^2)*n^2*log((b*x + a)/(d*x + c))^2 + (
A^2 + 2*A*B + B^2)*m^2 + 2*((A*B + B^2)*m^2 + A*B + B^2 + 2*(A*B + B^2)*m)*
n*log((b*x + a)/(d*x + c)) + A^2 + 2*A*B + B^2 + 2*(A^2 + 2*A*B + B^2)*m)*E
i(((B*m + B)*n*log((b*x + a)/(d*x + c)) + (A + B)*m + A + B)/(B*n))*e^((B*m
*n*log(-I*g) - (A + B)*m - A - B)/(B*n)))/((B^5*b*c - B^5*a*d)*n^5*log((b*x
 + a)/(d*x + c))^2 + 2*((A*B^4 + B^5)*b*c - (A*B^4 + B^5)*a*d)*n^4*log((b*x
 + a)/(d*x + c)) + ((A^2*B^3 + 2*A*B^4 + B^5)*b*c - (A^2*B^3 + 2*A*B^4 + B^
5)*a*d)*n^3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^m*(I*d*x + I*c)^(-m - 2)/(B*log(((b*x + a)/(d*x + c
))^n*e) + A)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a\,g+b\,g\,x)^m}{(c\,i+d\,i\,x)^{m+2}\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^m/((c*i + d*i*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))^3),x)
```

```
[Out] int((a*g + b*g*x)^m/((c*i + d*i*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))^3), x)
```

3.218 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3$

Optimal. Leaf size=309

$$-\frac{6B^3n^3(a+bx)(g(a+bx))^{-2-m}(i(c+dx))^{2+m}}{(bc-ad)i^2(1+m)^4(c+dx)}-\frac{6B^2n^2(a+bx)(g(a+bx))^{-2-m}(i(c+dx))^{2+m}\left(A+B\log\right.}{(bc-ad)i^2(1+m)^3(c+dx)}$$

```
[Out] -6*B^3*n^3*(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)/(-a*d+b*c)/i^2/(1+m
)^4/(d*x+c)-6*B^2*n^2*(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)*(A+B*ln(
e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)/i^2/(1+m)^3/(d*x+c)-3*B*n*(b*x+a)*(g*(b*
x+a))^(-2-m)*(i*(d*x+c))^(2+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)
/i^2/(1+m)^2/(d*x+c)-(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)*(A+B*ln(e
*((b*x+a)/(d*x+c))^n))^3/(-a*d+b*c)/i^2/(1+m)/(d*x+c)
```

Rubi [A]

time = 0.22, antiderivative size = 309, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {2563, 2342, 2341}

$$-\frac{6B^2n^2(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)^3(c+dx)(bc-ad)}-\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{i^2(m+1)(c+dx)(bc-ad)}-\frac{3Bn(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^2(m+1)^2(c+dx)(bc-ad)}-\frac{6B^3n^3(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}}{i^2(m+1)^4(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^3,x]
```

```
[Out] (-6*B^3*n^3*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/((b*c -
 a*d)*i^2*(1 + m)^4*(c + d*x)) - (6*B^2*n^2*(a + b*x)*(g*(a + b*x))^(-2 - m
)*(i*(c + d*x))^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d
)*i^2*(1 + m)^3*(c + d*x)) - (3*B*n*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c
+ d*x))^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)*i^2*
(1 + m)^2*(c + d*x)) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 +
 m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/((b*c - a*d)*i^2*(1 + m)*(c +
 d*x))
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int (218c+218dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3\,dx = \int \left(A^3(218c+218dx)^m(ag+bgx)\right.$$

$$= A^3\int (218c+218dx)^m(ag+bgx)^{-2}$$

$$= -\frac{A^3(218c+218dx)^{1+m}(ag+bgx)}{218(bc-ad)g(1+m)}$$

$$= -\frac{A^3(218c+218dx)^{1+m}(ag+bgx)}{218(bc-ad)g(1+m)}$$

$$= -\frac{3\ 218^m A^2Bn(c+dx)^{1+m}(ag+bg}{(bc-ad)g(1+m)^2}$$

Mathematica [A]
time = 4.38, size = 206, normalized size = 0.67

$$-\frac{(g(a+bx))^{-1-m}(c+dx)(i(c+dx))^m\left(A^3(1+m)^3+3A^2B(1+m)^2n+6AB^2(1+m)n^2+6B^3n^3+3B(1+m)\left(A^2(1+m)^2+2AB(1+m)n+2B^2n^2\right)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3B^2(1+m)^2(A+Am+Bn)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+B^3(1+m)^3\log^3\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)g(1+m)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^3,x]
```

```
[Out] -(((g*(a + b*x))^(-1 - m)*(c + d*x)*(i*(c + d*x))^m*(A^3*(1 + m)^3 + 3*A^2*
B*(1 + m)^2*n + 6*A*B^2*(1 + m)*n^2 + 6*B^3*n^3 + 3*B*(1 + m)*(A^2*(1 + m)^
2 + 2*A*B*(1 + m)*n + 2*B^2*n^2)*Log[e*((a + b*x)/(c + d*x))^n] + 3*B^2*(1
+ m)^2*(A + A*m + B*n)*Log[e*((a + b*x)/(c + d*x))^n]^2 + B^3*(1 + m)^3*Log
[e*((a + b*x)/(c + d*x))^n]^3))/((b*c - a*d)*g*(1 + m)^4))
```

Maple [F]
time = 0.24, size = 0, normalized size = 0.00

$$\int (bgx + ag)^{-2-m} (dix + ci)^{m} \left(A + B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^{n}\right)\right)^{3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^3*(b*g*x + a*g)^(-m - 2)*(
I*d*x + I*c)^m, x)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2059 vs. 2(303) = 606.
time = 0.43, size = 2059, normalized size = 6.66

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] -(6*B^3*a*c*n^3 + (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*c*m^3 + 3*(A^3 + 3*A^2*
B + 3*A*B^2 + B^3)*a*c*m^2 + 3*(A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*c*m + ((B^
3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^3*x^2 + (B^3*b*c + B^3
*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B
^3*a*d)*m)*n^3*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n^
3)*log((b*x + a)/(d*x + c))^3 + (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*c + 6*((A
*B^2 + B^3)*a*c*m + (A*B^2 + B^3)*a*c)*n^2 + (6*B^3*b*d*n^3 + (A^3 + 3*A^2*
B + 3*A*B^2 + B^3)*b*d*m^3 + 3*(A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*d*m^2 + 3*
(A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*d*m + (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*d
 + 6*((A*B^2 + B^3)*b*d*m + (A*B^2 + B^3)*b*d)*n^2 + 3*((A^2*B + 2*A*B^2 +
B^3)*b*d*m^2 + 2*(A^2*B + 2*A*B^2 + B^3)*b*d*m + (A^2*B + 2*A*B^2 + B^3)*b*
d)*n)*x^2 + 3*((B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n^3 + ((A*B^2 + B^3)*a
```

```
*c*m^3 + 3*(A*B^2 + B^3)*a*c*m^2 + 3*(A*B^2 + B^3)*a*c*m + (A*B^2 + B^3)*a*
c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n^3 + ((A*B^2 + B^3)*b*d*m^
3 + 3*(A*B^2 + B^3)*b*d*m^2 + 3*(A*B^2 + B^3)*b*d*m + (A*B^2 + B^3)*b*d)*n^
2)*x^2 + ((B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a
*d)*m)*n^3 + (((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d)*m^3 + (A*B^2 + B^3)*b
*c + (A*B^2 + B^3)*a*d + 3*((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d)*m^2 + 3*
((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d)*m)*n^2)*x)*log((b*x + a)/(d*x + c))
^2 + 3*((A^2*B + 2*A*B^2 + B^3)*a*c*m^2 + 2*(A^2*B + 2*A*B^2 + B^3)*a*c*m +
 (A^2*B + 2*A*B^2 + B^3)*a*c)*n + (((A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*c + (
A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*d)*m^3 + 6*(B^3*b*c + B^3*a*d)*n^3 + (A^3
+ 3*A^2*B + 3*A*B^2 + B^3)*b*c + (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*d + 3*((
A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*c + (A^3 + 3*A^2*B + 3*A*B^2 + B^3)*a*d)*m
^2 + 6*((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d + ((A*B^2 + B^3)*b*c + (A*B^2
 + B^3)*a*d)*m)*n^2 + 3*((A^3 + 3*A^2*B + 3*A*B^2 + B^3)*b*c + (A^3 + 3*A^2
*B + 3*A*B^2 + B^3)*a*d)*m + 3*((A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*
B^2 + B^3)*a*d + ((A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d
)*m^2 + 2*((A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d)*m)*n)
*x + 3*(2*(B^3*a*c*m + B^3*a*c)*n^3 + 2*((A*B^2 + B^3)*a*c*m^2 + 2*(A*B^2 +
 B^3)*a*c*m + (A*B^2 + B^3)*a*c)*n^2 + (2*(B^3*b*d*m + B^3*b*d)*n^3 + 2*((A
*B^2 + B^3)*b*d*m^2 + 2*(A*B^2 + B^3)*b*d*m + (A*B^2 + B^3)*b*d)*n^2 + ((A^
2*B + 2*A*B^2 + B^3)*b*d*m^3 + 3*(A^2*B + 2*A*B^2 + B^3)*b*d*m^2 + 3*(A^2*B
 + 2*A*B^2 + B^3)*b*d*m + (A^2*B + 2*A*B^2 + B^3)*b*d)*n)*x^2 + ((A^2*B + 2
*A*B^2 + B^3)*a*c*m^3 + 3*(A^2*B + 2*A*B^2 + B^3)*a*c*m^2 + 3*(A^2*B + 2*A*
B^2 + B^3)*a*c*m + (A^2*B + 2*A*B^2 + B^3)*a*c)*n + (2*(B^3*b*c + B^3*a*d +
 (B^3*b*c + B^3*a*d)*m)*n^3 + 2*((A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d + ((
A*B^2 + B^3)*b*c + (A*B^2 + B^3)*a*d)*m^2 + 2*((A*B^2 + B^3)*b*c + (A*B^2 +
 B^3)*a*d)*m)*n^2 + (((A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)
*a*d)*m^3 + (A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d + 3*(
(A^2*B + 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d)*m^2 + 3*((A^2*B
+ 2*A*B^2 + B^3)*b*c + (A^2*B + 2*A*B^2 + B^3)*a*d)*m)*n)*x)*log((b*x + a)/
(d*x + c)))*(I*d*x + I*c)^m*e^(-(m + 2)*log(I*d*x + I*c) - (m + 2)*log(-I*g
) - (m + 2)*log((b*x + a)/(d*x + c)))/((b*c - a*d)*m^4 + 4*(b*c - a*d)*m^3
+ 6*(b*c - a*d)*m^2 + b*c - a*d + 4*(b*c - a*d)*m)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)
```

```
[Out] Timed out
```

Giac [**F**]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^3*(b*g*x + a*g)^(-m - 2)*(
I*d*x + I*c)^m, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^m\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^3}{(a\,g+b\,g\,x)^{m+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^3)/(a*g + b*g*x
)^(m + 2),x)
```

```
[Out] int(((c*i + d*i*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^3)/(a*g + b*g*x
)^(m + 2), x)
```

3.219 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2$ d

Optimal. Leaf size=223

$$-\frac{2B^2n^2(a+bx)(g(a+bx))^{-2-m}(i(c+dx))^{2+m}}{(bc-ad)i^2(1+m)^3(c+dx)}-\frac{2Bn(a+bx)(g(a+bx))^{-2-m}(i(c+dx))^{2+m}\left(A+B\log\left(e\right.\right.}{(bc-ad)i^2(1+m)^2(c+dx)}$$

```
[Out] -2*B^2*n^2*(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)/(-a*d+b*c)/i^2/(1+m
)^3/(d*x+c)-2*B*n*(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)*(A+B*ln(e*((
b*x+a)/(d*x+c))^n))/(-a*d+b*c)/i^2/(1+m)^2/(d*x+c)-(b*x+a)*(g*(b*x+a))^(-2-
m)*(i*(d*x+c))^(2+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)/i^2/(1+m)
/(d*x+c)
```

Rubi [A]
time = 0.17, antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {2563, 2342, 2341}

$$-\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^2(m+1)(c+dx)(bc-ad)}-\frac{2Bn(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)^2(c+dx)(bc-ad)}-\frac{2B^2n^2(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}}{i^2(m+1)^3(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2,x]
```

```
[Out] (-2*B^2*n^2*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/((b*c -
 a*d)*i^2*(1 + m)^3*(c + d*x)) - (2*B*n*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i
*(c + d*x))^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*i^
2*(1 + m)^2*(c + d*x)) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2
 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)*i^2*(1 + m)*(c
 + d*x))
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^p/(d*(m + 1))), x] - Dist[b*n*
(p/(m + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int (219c+219dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx = \int \left(A^2(219c+219dx)^m(ag+bgx\right.$$

$$= A^2\int (219c+219dx)^m(ag+bgx)^{-}$$

$$= -\frac{A^2(219c+219dx)^{1+m}(ag+bgx}{219(bc-ad)g(1+m)}$$

$$= -\frac{A^2(219c+219dx)^{1+m}(ag+bgx}{219(bc-ad)g(1+m)}$$

$$= -\frac{2\ 219^m ABn(c+dx)^{1+m}(ag+b}{(bc-ad)g(1+m)^2}$$

Mathematica [A]
time = 1.31, size = 134, normalized size = 0.60

$$-\frac{(g(a+bx))^{-1-m}(c+dx)(i(c+dx))^m\left(A^2(1+m)^2+2AB(1+m)n+2B^2n^2+2B(1+m)(A+Am+Bn)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+B^2(1+m)^2\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)g(1+m)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2,x]
```

```
[Out] -(((g*(a + b*x))^(-1 - m)*(c + d*x)*(i*(c + d*x))^m*(A^2*(1 + m)^2 + 2*A*B*
(1 + m)*n + 2*B^2*n^2 + 2*B*(1 + m)*(A + A*m + B*n)*Log[e*((a + b*x)/(c + d
*x))^n] + B^2*(1 + m)^2*Log[e*((a + b*x)/(c + d*x))^n]^2))/((b*c - a*d)*g*(
1 + m)^3))
```

Maple [F]
time = 0.22, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^{-2-m}\left(dix+ci\right)^m\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="maxima")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^2*(b*g*x + a*g)^(-m - 2)*(
I*d*x + I*c)^m, x)
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 802 vs. $2(218) = 436$.
time = 0.41, size = 802, normalized size = 3.60

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="fricas")
```

```
[Out] -(2*B^2*a*c*n^2 + (A^2 + 2*A*B + B^2)*a*c*m^2 + 2*(A^2 + 2*A*B + B^2)*a*c*m
 + (A^2 + 2*A*B + B^2)*a*c + (2*B^2*b*d*n^2 + (A^2 + 2*A*B + B^2)*b*d*m^2 +
 2*(A^2 + 2*A*B + B^2)*b*d*m + (A^2 + 2*A*B + B^2)*b*d + 2*((A*B + B^2)*b*d
*m + (A*B + B^2)*b*d)*n)*x^2 + ((B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*n^2*x
^2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m
)*n^2*x + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c)*n^2)*log((b*x + a)/(d*x + c
))^2 + 2*((A*B + B^2)*a*c*m + (A*B + B^2)*a*c)*n + ((A^2 + 2*A*B + B^2)*b*c
 + (A^2 + 2*A*B + B^2)*a*d + ((A^2 + 2*A*B + B^2)*b*c + (A^2 + 2*A*B + B^2)
*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*n^2 + 2*((A^2 + 2*A*B + B^2)*b*c + (A^2 +
 2*A*B + B^2)*a*d)*m + 2*((A*B + B^2)*b*c + (A*B + B^2)*a*d + ((A*B + B^2)*
b*c + (A*B + B^2)*a*d)*m)*n)*x + 2*((B^2*a*c*m + B^2*a*c)*n^2 + ((B^2*b*d*m
 + B^2*b*d)*n^2 + ((A*B + B^2)*b*d*m^2 + 2*(A*B + B^2)*b*d*m + (A*B + B^2)*
b*d)*n)*x^2 + ((A*B + B^2)*a*c*m^2 + 2*(A*B + B^2)*a*c*m + (A*B + B^2)*a*c)
*n + ((B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m)*n^2 + ((A*B + B^2)*b*c +
(A*B + B^2)*a*d + ((A*B + B^2)*b*c + (A*B + B^2)*a*d)*m^2 + 2*((A*B + B^2)*
b*c + (A*B + B^2)*a*d)*m)*n)*x)*log((b*x + a)/(d*x + c)))*(I*d*x + I*c)^m*e
^(-(m + 2)*log(I*d*x + I*c) - (m + 2)*log(-I*g) - (m + 2)*log((b*x + a)/(d*
x + c)))/((b*c - a*d)*m^3 + 3*(b*c - a*d)*m^2 + b*c - a*d + 3*(b*c - a*d)*m
)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**2,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)^2*(b*g*x + a*g)^(-m - 2)*(
I*d*x + I*c)^m, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(c\,i+d\,i\,x\right)}^m\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{{\left(a\,g+b\,g\,x\right)}^{m+2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^(m + 2),x)
```

```
[Out] int(((c*i + d*i*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2)/(a*g + b*g*x
)^(m + 2), x)
```

3.220 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) d$

Optimal. Leaf size=137

$$-\frac{Bn(a+bx)(g(a+bx))^{-2-m}(i(c+dx))^{2+m}}{(bc-ad)i^2(1+m)^2(c+dx)}-\frac{(a+bx)(g(a+bx))^{-2-m}(i(c+dx))^{2+m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{(bc-ad)i^2(1+m)(c+dx)}$$

```
[Out] -B*n*(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)/(-a*d+b*c)/i^2/(1+m)^2/(d
*x+c)-(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)*(A+B*ln(e*((b*x+a)/(d*x+
c))^n))/(-a*d+b*c)/i^2/(1+m)/(d*x+c)
```

Rubi [A]

time = 0.11, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$, Rules used = {2563, 2341}

$$-\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)(c+dx)(bc-ad)}-\frac{Bn(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}}{i^2(m+1)^2(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]),x]
```

```
[Out] -((B*n*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/((b*c - a*d)
*i^2*(1 + m)^2*(c + d*x))) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x)
)^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*i^2*(1 + m)*
(c + d*x))
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])/(d*(m + 1))), x] - Simp[b*n*((d*x)^(
m + 1)/(d*(m + 1)^2)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int (220c+220dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx = \int \left(A(220c+220dx)^m(ag+bgx)^-\right.$$

$$= A\int (220c+220dx)^m(ag+bgx)^{-2}$$

$$= -\frac{A(220c+220dx)^{1+m}(ag+bgx)^-}{220(bc-ad)g(1+m)}$$

$$= -\frac{A(220c+220dx)^{1+m}(ag+bgx)^-}{220(bc-ad)g(1+m)}$$

$$= -\frac{220^mBn(c+dx)^{1+m}(ag+bgx)^-}{(bc-ad)g(1+m)^2}$$

Mathematica [A]
time = 0.33, size = 78, normalized size = 0.57

$$-\frac{(g(a+bx))^{-1-m}(c+dx)(i(c+dx))^m\left(A+Am+Bn+B(1+m)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)g(1+m)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]),x]
```

```
[Out] -(((g*(a + b*x))^(-1 - m)*(c + d*x)*(i*(c + d*x))^m*(A + A*m + B*n + B*(1 +
 m)*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*g*(1 + m)^2))
```

Maple [F]
time = 0.24, size = 0, normalized size = 0.00

$$\int (bgx+ag)^{-2-m}(dix+ci)^m\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="maxima")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)*(b*g*x + a*g)^(-m - 2)*(I*
d*x + I*c)^m, x)
```

Fricas [A]
time = 0.40, size = 238, normalized size = 1.74

$$-\frac{((A+B)acm+Bacn+(A+B)ac+((A+B)bdm+Bbdn+(A+B)bd)x^2+((A+B)bc+(A+B)ad+((A+B)bc+(A+B)ad)m+(Bbc+Bad)n)x+((Bbdm+Bbd)nx^2+(Bbc+Bad+(Bbc+Bad)m)nx+(Bacm+Bac)n)\log\left(\frac{bx+a}{dx+c}\right))(i\,dx+i\,c)^m e^{\left(-(m+2)\log(i\,dx+i\,c)-(m+2)\log(-i\,g)-(m+2)\log\left(\frac{bx+a}{dx+c}\right)\right)}}{(bc-ad)m^2+bc-ad+2\,(bc-ad)m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="fricas")
```

```
[Out] -((A + B)*a*c*m + B*a*c*n + (A + B)*a*c + ((A + B)*b*d*m + B*b*d*n + (A + B
)*b*d)*x^2 + ((A + B)*b*c + (A + B)*a*d + ((A + B)*b*c + (A + B)*a*d)*m + (
B*b*c + B*a*d)*n)*x + ((B*b*d*m + B*b*d)*n*x^2 + (B*b*c + B*a*d + (B*b*c +
B*a*d)*m)*n*x + (B*a*c*m + B*a*c)*n)*log((b*x + a)/(d*x + c)))*(I*d*x + I*c
)^m*e^(-(m + 2)*log(I*d*x + I*c) - (m + 2)*log(-I*g) - (m + 2)*log((b*x + a
)/(d*x + c)))/((b*c - a*d)*m^2 + b*c - a*d + 2*(b*c - a*d)*m)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
)),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="giac")
```

```
[Out] integrate((B*log(((b*x + a)/(d*x + c))^n*e) + A)*(b*g*x + a*g)^(-m - 2)*(I*
d*x + I*c)^m, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(c\,i+d\,i\,x)^m\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}{(a\,g+b\,g\,x)^{m+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
(m + 2),x)
```

```
[Out] int(((c*i + d*i*x)^m*(A + B*log(e*((a + b*x)/(c + d*x))^n)))/(a*g + b*g*x)^
(m + 2), x)
```

3.221 $\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=128

$$\frac{e^{\frac{A(1+m)}{Bn}}(a+bx)(g(a+bx))^{-2-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1+m}{n}}(i(c+dx))^{2+m}\operatorname{Ei}\left(-\frac{(1+m)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B(bc-ad)i^2n(c+dx)}$$

```
[Out] exp(A*(1+m)/B/n)*(b*x+a)*(g*(b*x+a))^(-2-m)*(e*((b*x+a)/(d*x+c))^n)^((1+m)/
n)*(i*(d*x+c))^(2+m)*Ei(-(1+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)/B/(-a*d
+b*c)/i^2/n/(d*x+c)
```

Rubi [A]
time = 0.19, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {2563, 2347, 2209}

$$\frac{(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}\operatorname{Ei}\left(-\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bi^2n(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/(c + d
*x))^n]),x]
```

```
[Out] (E^((A*(1 + m))/(B*n))*(a + b*x)*(g*(a + b*x))^(-2 - m)*(e*((a + b*x)/(c +
d*x))^n)^((1 + m)/n)*(i*(c + d*x))^(2 + m)*ExpIntegralEi[-(((1 + m)*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(B*n))])/(B*(b*c - a*d)*i^2*n*(c + d*x))
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
```

```
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int \frac{(221c+221dx)^m(ag+bgx)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx=\int \frac{(221c+221dx)^m(ag+bgx)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Mathematica [F]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n]),x]
```

```
[Out] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n]), x]
```

Maple [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^{-2-m}\,(dix+ci)^m}{A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(I*d*x + I*c)^m/(B*log(((b*x + a)/(d*x + c
))^n*e) + A), x)
```

Fricas [A]
time = 0.42, size = 90, normalized size = 0.70

$$-\frac{\operatorname{Ei}\left(-\frac{(Bm+B)n\log\left(\frac{bx+a}{dx+c}\right)+(A+B)m+A+B}{Bn}\right)e^{\left(-\frac{(Bm+2\,B)n\log(-i\,g)-(A+B)m-A-B}{Bn}\right)}}{(Bbc-Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="fricas")
```

```
[Out] -Ei(-((B*m + B)*n*log((b*x + a)/(d*x + c)) + (A + B)*m + A + B)/(B*n))*e^(-
((B*m + 2*B)*n*log(-I*g) - (A + B)*m - A - B)/(B*n))/((B*b*c - B*a*d)*n)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m/(A+B*ln(e*((b*x+a)/(d*x+c))**n
)),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6439 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(I*d*x + I*c)^m/(B*log(((b*x + a)/(d*x + c
))^n*e) + A), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(c\,i+d\,i\,x)^m}{(a\,g+b\,g\,x)^{m+2}\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)^m/((a*g + b*g*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))),x)
```

```
[Out] int((c*i + d*i*x)^m/((a*g + b*g*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))), x)
```

3.222 $\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=214

$$-\frac{e^{\frac{A(1+m)}{Bn}}(1+m)(a+bx)(g(a+bx))^{-2-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1+m}{n}}(i(c+dx))^{2+m}\text{Ei}\left(-\frac{(1+m)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2(bc-ad)i^2n^2(c+dx)}-\frac{}{B(}$$

```
[Out] -exp(A*(1+m)/B/n)*(1+m)*(b*x+a)*(g*(b*x+a))^(-2-m)*(e*((b*x+a)/(d*x+c))^n)^
((1+m)/n)*(i*(d*x+c))^(2+m)*Ei(-(1+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)/
B^2/(-a*d+b*c)/i^2/n^2/(d*x+c)-(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)
/B/(-a*d+b*c)/i^2/n/(d*x+c)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))
```

Rubi [A]
time = 0.22, antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.082$, Rules used = {2563, 2343, 2347, 2209}

$$-\frac{(m+1)(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}\text{Ei}\left(-\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2i^2n^2(c+dx)(bc-ad)}-\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}}{Bi^2n(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^2,x]
```

```
[Out] -((E^((A*(1 + m))/(B*n))*(1 + m)*(a + b*x)*(g*(a + b*x))^(-2 - m)*(e*((a +
b*x)/(c + d*x))^n)^((1 + m)/n)*(i*(c + d*x))^(2 + m)*ExpIntegralEi[-(((1 +
m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(B*n))])/(B^2*(b*c - a*d)*i^2*n^
2*(c + d*x))) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/(B
*(b*c - a*d)*i^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^(p + 1)/(b*d*n*(p + 1))), x] -
Dist[(m + 1)/(b*n*(p + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p + 1), x], x]
/; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1] && LtQ[p, -1]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int \frac{(222c+222dx)^m(ag+bgx)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{(222c+222dx)^m(ag+bgx)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2,x]
```

```
[Out] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2, x]
```

Maple [F]
time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^{-2-m}\,(dix+ci)^m}{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="maxima")
```

```
[Out] ((-1)^(1/2*m)*m + (-1)^(1/2*m))*integrate(-(d*x + c)^m/((B^2*b^2*g^(m + 2)*
n*x^2 + 2*B^2*a*b*g^(m + 2)*n*x + B^2*a^2*g^(m + 2)*n)*(b*x + a)^m*log((b*x
 + a)^n) - (B^2*b^2*g^(m + 2)*n*x^2 + 2*B^2*a*b*g^(m + 2)*n*x + B^2*a^2*g^(
m + 2)*n)*(b*x + a)^m*log((d*x + c)^n) + (A*B*a^2*g^(m + 2)*n + B^2*a^2*g^(
m + 2)*n + (A*B*b^2*g^(m + 2)*n + B^2*b^2*g^(m + 2)*n)*x^2 + 2*(A*B*a*b*g^(
m + 2)*n + B^2*a*b*g^(m + 2)*n)*x)*(b*x + a)^m), x) - ((-1)^(1/2*m)*d*x + (
-1)^(1/2*m)*c)*(d*x + c)^m/(((b^2*c*g^(m + 2)*n - a*b*d*g^(m + 2)*n)*B^2*x
+ (a*b*c*g^(m + 2)*n - a^2*d*g^(m + 2)*n)*B^2)*(b*x + a)^m*log((b*x + a)^n)
 - ((b^2*c*g^(m + 2)*n - a*b*d*g^(m + 2)*n)*B^2*x + (a*b*c*g^(m + 2)*n - a^
2*d*g^(m + 2)*n)*B^2)*(b*x + a)^m*log((d*x + c)^n) + ((a*b*c*g^(m + 2)*n -
a^2*d*g^(m + 2)*n)*A*B + (a*b*c*g^(m + 2)*n - a^2*d*g^(m + 2)*n)*B^2 + ((b^
2*c*g^(m + 2)*n - a*b*d*g^(m + 2)*n)*A*B + (b^2*c*g^(m + 2)*n - a*b*d*g^(m
+ 2)*n)*B^2)*x)*(b*x + a)^m)
```

Fricas [A]
time = 0.42, size = 253, normalized size = 1.18

$$-\frac{(Bbdnx^2 + Bacn + (Bbc + Bad)nx)(i\,dx + i\,c)^m e^{\left(-(m+2)\log(i\,dx+i\,c)-(m+2)\log(-i\,g)-(m+2)\log\left(\frac{bx+a}{dx+c}\right)\right)} - ((Bm + B)n\log\left(\frac{bx+a}{dx+c}\right) + (A + B)m + A + B)\mathrm{Ei}\left(-\frac{(Bm+B)n\log\left(\frac{bx+a}{dx+c}\right)+(A+B)m+A+B}{Bn}\right)e^{\left(-\frac{(Bm+2\,B)n\log(-i\,g)-(A+B)m-A-B}{Bn}\right)}}{(B^3bc - B^3ad)n^3\log\left(\frac{bx+a}{dx+c}\right) + ((AB^2 + B^3)bc - (AB^2 + B^3)ad)n^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="fricas")
```

```
[Out] -((B*b*d*n*x^2 + B*a*c*n + (B*b*c + B*a*d)*n*x)*(I*d*x + I*c)^m*e^(-(m + 2)
*log(I*d*x + I*c) - (m + 2)*log(-I*g) - (m + 2)*log((b*x + a)/(d*x + c))) -
 ((B*m + B)*n*log((b*x + a)/(d*x + c)) + (A + B)*m + A + B)*Ei(-((B*m + B)*
n*log((b*x + a)/(d*x + c)) + (A + B)*m + A + B)/(B*n))*e^(-((B*m + 2*B)*n*l
og(-I*g) - (A + B)*m - A - B)/(B*n)))/((B^3*b*c - B^3*a*d)*n^3*log((b*x + a
)/(d*x + c)) + ((A*B^2 + B^3)*b*c - (A*B^2 + B^3)*a*d)*n^2)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**2,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6439 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(I*d*x + I*c)^m/(B*log(((b*x + a)/(d*x + c
))^n*e) + A)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^m}{(a\,g+b\,g\,x)^{m+2}\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)^m/((a*g + b*g*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))^2),x)
```

```
[Out] int((c*i + d*i*x)^m/((a*g + b*g*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))^2), x)
```

3.223 $\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$

Optimal. Leaf size=306

$$\frac{e^{\frac{A(1+m)}{Bn}}(1+m)^2(a+bx)(g(a+bx))^{-2-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1+m}{n}}(i(c+dx))^{2+m}\text{Ei}\left(-\frac{(1+m)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{2B^3(bc-ad)i^2n^3(c+dx)}-\frac{}{2B(}$$

```
[Out] 1/2*exp(A*(1+m)/B/n)*(1+m)^2*(b*x+a)*(g*(b*x+a))^(-2-m)*(e*((b*x+a)/(d*x+c)
)^n)^((1+m)/n)*(i*(d*x+c))^(2+m)*Ei(-(1+m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/
B/n)/B^3/(-a*d+b*c)/i^2/n^3/(d*x+c)-1/2*(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+
c))^(2+m)/B/(-a*d+b*c)/i^2/n/(d*x+c)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2+1/2*
(1+m)*(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)/B^2/(-a*d+b*c)/i^2/n^2/(
d*x+c)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))
```

Rubi [A]

time = 0.26, antiderivative size = 306, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.082$, Rules used = {2563, 2343, 2347, 2209}

$$\frac{(m+1)^2(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}\text{Ei}\left(-\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{2B^3i^2n^3(c+dx)(bc-ad)}+\frac{(m+1)(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}}{2B^2i^2n^2(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}-\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}}{2Bi^2n(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^3,x]
```

```
[Out] (E^((A*(1 + m))/(B*n))*(1 + m)^2*(a + b*x)*(g*(a + b*x))^(-2 - m)*(e*((a +
b*x)/(c + d*x))^n)^((1 + m)/n)*(i*(c + d*x))^(2 + m)*ExpIntegralEi[-(((1 +
m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(B*n))])/(2*B^3*(b*c - a*d)*i^2*
n^3*(c + d*x)) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/(
2*B*(b*c - a*d)*i^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) +
 ((1 + m)*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/(2*B^2*(b
*c - a*d)*i^2*n^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(d*x)^(m + 1)*((a + b*Log[c*x^n])^(p + 1)/(b*d*n*(p + 1))), x] -
```

```
Dist[(m + 1)/(b*n*(p + 1)), Int[(d*x)^m*(a + b*Log[c*x^n])^(p + 1), x], x]
/; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1] && LtQ[p, -1]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rubi steps

$$\int \frac{(223c+223dx)^m(ag+bgx)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx=\int \frac{(223c+223dx)^m(ag+bgx)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Mathematica [F]
time = 0.22, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^3,x]
```

```
[Out] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^3, x]
```

Maple [F]
time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{(bgx+ag)^{-2-m}\,(dix+ci)^m}{\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] -((-1)^(1/2*m)*m^2 + 2*(-1)^(1/2*m)*m + (-1)^(1/2*m))*integrate(-1/2*(d*x +
 c)^m/((B^3*b^2*g^(m + 2)*n^2*x^2 + 2*B^3*a*b*g^(m + 2)*n^2*x + B^3*a^2*g^(
m + 2)*n^2)*(b*x + a)^m*log((b*x + a)^n) - (B^3*b^2*g^(m + 2)*n^2*x^2 + 2*B
^3*a*b*g^(m + 2)*n^2*x + B^3*a^2*g^(m + 2)*n^2)*(b*x + a)^m*log((d*x + c)^n
) + (A*B^2*a^2*g^(m + 2)*n^2 + B^3*a^2*g^(m + 2)*n^2 + (A*B^2*b^2*g^(m + 2)
*n^2 + B^3*b^2*g^(m + 2)*n^2)*x^2 + 2*(A*B^2*a*b*g^(m + 2)*n^2 + B^3*a*b*g^
(m + 2)*n^2)*x)*(b*x + a)^m), x) + 1/2*((((-1)^(1/2*m)*m + (-1)^(1/2*m))*B*
d*x + ((-1)^(1/2*m)*m + (-1)^(1/2*m))*B*c)*(d*x + c)^m*log((b*x + a)^n) - (
((-1)^(1/2*m)*m + (-1)^(1/2*m))*B*d*x + ((-1)^(1/2*m)*m + (-1)^(1/2*m))*B*c
)*(d*x + c)^m*log((d*x + c)^n) + (((-1)^(1/2*m)*m + (-1)^(1/2*m))*A*c + ((-
1)^(1/2*m)*m - (-1)^(1/2*m)*(n - 1))*B*c + (((-1)^(1/2*m)*m + (-1)^(1/2*m))
*A*d + ((-1)^(1/2*m)*m - (-1)^(1/2*m)*(n - 1))*B*d)*x)*(d*x + c)^m)/(((b^2*
c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*B^4*x + (a*b*c*g^(m + 2)*n^2 - a^2*d
*g^(m + 2)*n^2)*B^4)*(b*x + a)^m*log((b*x + a)^n)^2 + ((b^2*c*g^(m + 2)*n^2
 - a*b*d*g^(m + 2)*n^2)*B^4*x + (a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)
*B^4)*(b*x + a)^m*log((d*x + c)^n)^2 + 2*((a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m
 + 2)*n^2)*A*B^3 + (a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*B^4 + ((b^2*
c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*A*B^3 + (b^2*c*g^(m + 2)*n^2 - a*b*d
*g^(m + 2)*n^2)*B^4)*x)*(b*x + a)^m*log((b*x + a)^n) + ((a*b*c*g^(m + 2)*n^
2 - a^2*d*g^(m + 2)*n^2)*A^2*B^2 + 2*(a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)
*n^2)*A*B^3 + (a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*B^4 + ((b^2*c*g^(
m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*A^2*B^2 + 2*(b^2*c*g^(m + 2)*n^2 - a*b*d*
g^(m + 2)*n^2)*A*B^3 + (b^2*c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*B^4)*x)*
(b*x + a)^m - 2*(((b^2*c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*B^4*x + (a*b*
c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*B^4)*(b*x + a)^m*log((b*x + a)^n) +
((a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*A*B^3 + (a*b*c*g^(m + 2)*n^2 -
 a^2*d*g^(m + 2)*n^2)*B^4 + ((b^2*c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*A*
B^3 + (b^2*c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*B^4)*x)*(b*x + a)^m)*log(
(d*x + c)^n))
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 612 vs. 2(297) = 594.

time = 0.45, size = 612, normalized size = 2.00

$$-\frac{\left(B^2acn^2 + (B^2bdn^2 - ((AB + B^2)bdm + (AB + B^2)bd)n)x^2 - ((AB + B^2)acm + (AB + B^2)ac)n + ((B^2bc + B^2ad)n^2 - ((AB + B^2)bc + (AB + B^2)ad + ((AB + B^2)bc + (AB + B^2)ad)m)n)x - ((B^2bdm + B^2bd)n^2x^2 + (B^2bc + B^2ad + (B^2bc + B^2ad)m)n^2x + (B^2acm + B^2ac)n^2)\log\left(\frac{bx+a}{dx+c}\right)\right)(i\,dx + i\,c)^m e^{\left(-(m+2)\log(i\,dx+i\,c)-(m+2)\log(-i\,g)-(m+2)\log\left(\frac{bx+a}{dx+c}\right)\right)} + \left((B^2m^2 + 2\,B^2m + B^2)n^2\log\left(\frac{bx+a}{dx+c}\right)^2 + (A^2 + 2\,AB + B^2)m^2 + 2\,((AB + B^2)m^2 + AB + B^2 + 2\,(AB + B^2)m)n\log\left(\frac{bx+a}{dx+c}\right) + A^2 + 2\,AB + B^2 + 2\,(A^2 + 2\,AB + B^2)m\right)\mathrm{Ei}\left(-\frac{(Bm+B)n\log\left(\frac{bx+a}{dx+c}\right)+(A+B)m+A+B}{Bn}\right)e^{\left(-\frac{(Bm+2\,B)n\log(-i\,g)-(A+B)m-A-B}{Bn}\right)}}{2\left((B^5bc - B^5ad)n^5\log\left(\frac{bx+a}{dx+c}\right)^2 + 2\,((AB^4 + B^5)bc - (AB^4 + B^5)ad)n^4\log\left(\frac{bx+a}{dx+c}\right) + ((A^2B^3 + 2\,AB^4 + B^5)bc - (A^2B^3 + 2\,AB^4 + B^5)ad)n^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] -1/2*((B^2*a*c*n^2 + (B^2*b*d*n^2 - ((A*B + B^2)*b*d*m + (A*B + B^2)*b*d)*n
)*x^2 - ((A*B + B^2)*a*c*m + (A*B + B^2)*a*c)*n + ((B^2*b*c + B^2*a*d)*n^2
- ((A*B + B^2)*b*c + (A*B + B^2)*a*d + ((A*B + B^2)*b*c + (A*B + B^2)*a*d)*
m)*n)*x - ((B^2*b*d*m + B^2*b*d)*n^2*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c +
B^2*a*d)*m)*n^2*x + (B^2*a*c*m + B^2*a*c)*n^2)*log((b*x + a)/(d*x + c)))*(I
*d*x + I*c)^m*e^(-(m + 2)*log(I*d*x + I*c) - (m + 2)*log(-I*g) - (m + 2)*lo
g((b*x + a)/(d*x + c))) + ((B^2*m^2 + 2*B^2*m + B^2)*n^2*log((b*x + a)/(d*x
 + c))^2 + (A^2 + 2*A*B + B^2)*m^2 + 2*((A*B + B^2)*m^2 + A*B + B^2 + 2*(A*
B + B^2)*m)*n*log((b*x + a)/(d*x + c)) + A^2 + 2*A*B + B^2 + 2*(A^2 + 2*A*B
 + B^2)*m)*Ei(-((B*m + B)*n*log((b*x + a)/(d*x + c)) + (A + B)*m + A + B)/(
B*n))*e^(-((B*m + 2*B)*n*log(-I*g) - (A + B)*m - A - B)/(B*n)))/((B^5*b*c -
 B^5*a*d)*n^5*log((b*x + a)/(d*x + c))^2 + 2*((A*B^4 + B^5)*b*c - (A*B^4 +
B^5)*a*d)*n^4*log((b*x + a)/(d*x + c)) + ((A^2*B^3 + 2*A*B^4 + B^5)*b*c - (
A^2*B^3 + 2*A*B^4 + B^5)*a*d)*n^3)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(I*d*x + I*c)^m/(B*log(((b*x + a)/(d*x + c
))^n*e) + A)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(c\,i+d\,i\,x)^m}{(a\,g+b\,g\,x)^{m+2}\,\left(A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*i + d*i*x)^m/((a*g + b*g*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))^3),x)
```

```
[Out] int((c*i + d*i*x)^m/((a*g + b*g*x)^(m + 2)*(A + B*log(e*((a + b*x)/(c + d*x
))^n))^3), x)
```

3.224 $\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=41

$$\frac{\log^{1+p}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)n(1+p)}$$

[Out] ln(e*((b*x+a)/(d*x+c))^n)^(1+p)/(-a*d+b*c)/n/(1+p)

Rubi [A]

time = 0.08, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.086$, Rules used = {2561, 2339, 30}

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[Log[e*((a + b*x)/(c + d*x))^n]^p/((a + b*x)*(c + d*x)),x]

[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c - a*d)*n*(1 + p))

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)}\,dx = \frac{\log^{1+p}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)n(1+p)}$$

Mathematica [A]
time = 0.02, size = 40, normalized size = 0.98

$$\frac{\log^{1+p}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bcn-adn)(1+p)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[e*((a + b*x)/(c + d*x))^n]^p/((a + b*x)*(c + d*x)),x]
```

```
[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c*n - a*d*n)*(1 + p))
```

Maple [F]
time = 0.22, size = 0, normalized size = 0.00

$$\int \frac{\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^p}{(bx+a)\,(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x)
```

```
[Out] int(ln(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x, algorithm="maxima
")
```

```
[Out] integrate(log(((b*x + a)/(d*x + c))^n*e)^p/((b*x + a)*(d*x + c)), x)
```

Fricas [A]
time = 0.40, size = 63, normalized size = 1.54

$$\frac{\left(n\log\left(\frac{bx+a}{dx+c}\right)+1\right)\left(n\log\left(\frac{bx+a}{dx+c}\right)+1\right)^p}{(bc-ad)np+(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x, algorithm="fricas
")
```

```
[Out] (n*log((b*x + a)/(d*x + c)) + 1)*(n*log((b*x + a)/(d*x + c)) + 1)^p/((b*c -
 a*d)*n*p + (b*c - a*d)*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(e*((b*x+a)/(d*x+c))**n)**p/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 3.38, size = 40, normalized size = 0.98

$$\frac{\left(n\log\left(\frac{bx+a}{dx+c}\right)+1\right)^{p+1}}{(bcn-adn)(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] (n*log((b*x + a)/(d*x + c)) + 1)^(p + 1)/((b*c*n - a*d*n)*(p + 1))
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^p}{(a+b\,x)\,(c+d\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(e*((a + b*x)/(c + d*x))^n)^p/((a + b*x)*(c + d*x)),x)
```

```
[Out] int(log(e*((a + b*x)/(c + d*x))^n)^p/((a + b*x)*(c + d*x)), x)
```

3.225 $\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ac+(bc+ad)x+bdx^2}\,dx$

Optimal. Leaf size=41

$$\frac{\log^{1+p}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)n(1+p)}$$

```
[Out] ln(e*((b*x+a)/(d*x+c))^n)^(1+p)/(-a*d+b*c)/n/(1+p)
```

Rubi [A]

time = 0.11, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2574, 2561, 2339, 30}

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[Log[e*((a + b*x)/(c + d*x))^n]^p/(a*c + (b*c + a*d)*x + b*d*x^2),x]
```

```
[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c - a*d)*n*(1 + p))
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2574

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_) + (h_.)*(x_)^2)^(m_.), x_Symbol] :> Dist[h^
```

```
m/(b^m*d^m), Int[(a + b*x)^m*(c + d*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, n, p}, x] && EqQ[b*d
*f - a*c*h, 0] && EqQ[b*d*g - h*(b*c + a*d), 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ac+(bc+ad)x+bdx^2}\,dx=\frac{\log^{1+p}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)n(1+p)}$$

Mathematica [A]
time = 0.01, size = 40, normalized size = 0.98

$$\frac{\log^{1+p}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bcn-adn)(1+p)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[e*((a + b*x)/(c + d*x))^n]^p/(a*c + (b*c + a*d)*x + b*d*x^2),
x]
[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c*n - a*d*n)*(1 + p))
```

Maple [F]
time = 0.49, size = 0, normalized size = 0.00

$$\int \frac{\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^p}{ca+(ad+cb)\,x+bd\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(e*((b*x+a)/(d*x+c))^n)^p/(c*a+(a*d+b*c)*x+b*d*x^2),x)
[Out] int(ln(e*((b*x+a)/(d*x+c))^n)^p/(c*a+(a*d+b*c)*x+b*d*x^2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(a*c+(a*d+b*c)*x+b*d*x^2),x, algorit
hm="maxima")
[Out] integrate(log(((b*x + a)/(d*x + c))^n*e)^p/(b*d*x^2 + a*c + (b*c + a*d)*x),
 x)
```

Fricas [**A**]
time = 0.45, size = 63, normalized size = 1.54

$$\frac{\left(n\log\left(\frac{bx+a}{dx+c}\right)+1\right)\left(n\log\left(\frac{bx+a}{dx+c}\right)+1\right)^{p}}{(bc-ad)np+(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(a*c+(a*d+b*c)*x+b*d*x^2),x, algorit
hm="fricas")
```

```
[Out] (n*log((b*x + a)/(d*x + c)) + 1)*(n*log((b*x + a)/(d*x + c)) + 1)^p/((b*c -
 a*d)*n*p + (b*c - a*d)*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(e*((b*x+a)/(d*x+c))**n)**p/(a*c+(a*d+b*c)*x+b*d*x**2),x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 4.67, size = 40, normalized size = 0.98

$$\frac{\left(n\log\left(\frac{bx+a}{dx+c}\right)+1\right)^{p+1}}{(bcn-adn)(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(a*c+(a*d+b*c)*x+b*d*x^2),x, algorit
hm="giac")
```

```
[Out] (n*log((b*x + a)/(d*x + c)) + 1)^(p + 1)/((b*c*n - a*d*n)*(p + 1))
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^{n}\right)^{p}}{b\,d\,x^2+\left(a\,d+b\,c\right)\,x+a\,c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(e*((a + b*x)/(c + d*x))^n)^p/(a*c + x*(a*d + b*c) + b*d*x^2),x)
```

```
[Out] int(log(e*((a + b*x)/(c + d*x))^n)^p/(a*c + x*(a*d + b*c) + b*d*x^2), x)
```

3.226 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e(a+bx)^n(c\right.\right.$

Optimal. Leaf size=193

$$\frac{e^{-\frac{A(1+m)}{Bn}}(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(e(a+bx)^n(c+dx)^{-n}\right)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)(A+B\log(e(a+bx)^n(c+\right.}{Bn}}{(bc-ad)i^2(1+m)(c+dx}$$

```
[Out] (b*x+a)*(g*(b*x+a))^m*GAMMA(1+p,-(1+m)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/B/
n)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(-a*d+b*c)/exp(A*(1+m)/B/n)/i^2/(1+m
)/(d*x+c)/((i*(d*x+c))^m)/((e*(b*x+a)^n/((d*x+c)^n))^((1+m)/n))/((-(1+m)*(A
+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/B/n)^p)
```

Rubi [A]
time = 0.31, antiderivative size = 193, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {2573, 2563, 2347, 2212}

$$\frac{(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e(a+bx)^n(c+dx)^{-n}\right)^{-\frac{m+1}{n}}\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^p\left(-\frac{(m+1)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{Bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{Bn}\right)}{i^2(m+1)(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])^p,x]
```

```
[Out] ((a + b*x)*(g*(a + b*x))^m*Gamma[1 + p, -(((1 + m)*(A + B*Log[(e*(a + b*x)^
n)/(c + d*x)^n]))/(B*n))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p)/((b*c
 - a*d)*E^((A*(1 + m))/(B*n))*i^2*(1 + m)*(c + d*x)*(i*(c + d*x))^m*((e*(a
+ b*x)^n)/(c + d*x)^n)^((1 + m)/n)*(-(((1 + m)*(A + B*Log[(e*(a + b*x)^n)/(
c + d*x)^n]))/(B*n)))^p)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\int (226c+226dx)^{-2-m}(ag+bgx)^m\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p\,dx=\int (226c+226dx)^{-2-m}(ag+$$

Mathematica [F]
time = 0.30, size = 0, normalized size = 0.00

$$\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^p,x]
```

```
[Out] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^p, x]
```

Maple [F]
time = 1.33, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^{m}\left(dix+ci\right)^{-2-m}\left(A+B\ln\left(e(bx+a)^{n}\left(dx+c\right)^{-n}\right)\right)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^m*(I*d*x + I*c)^(-m - 2)*(B*log((b*x + a)^n*e/(d*x
+ c)^n) + A)^p, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="fricas")
```

```
[Out] integral((I*d*x + I*c)^(-m - 2)*(cosh(-p*log(1/2*I*pi*B*n + B*n*log(b*x + a
) - B*n*log(I*d*x + I*c) + A + B)) - sinh(-p*log(1/2*I*pi*B*n + B*n*log(b*x
 + a) - B*n*log(I*d*x + I*c) + A + B)))*e^(m*log(b*x + a) + m*log(g)), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*(b*x+a)**n/((d*x+c)*
*n)))**p,x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:Simplification assuming sageVARc near 0Simplification ass
uming sageVARc near 0Simplification assuming t_nostep near 0Simplification
assuming
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a\,g+b\,g\,x)^m\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^p}{(c\,i+d\,i\,x)^{m+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a*g + b*g*x)^m*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p)/(c*i + d*i
*x)^(m + 2),x)
```

```
[Out] int(((a*g + b*g*x)^m*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p)/(c*i + d*i
*x)^(m + 2), x)
```

3.227 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e(a+bx)^n(c\right.\right.$

Optimal. Leaf size=194

$$-\frac{e^{\frac{A(1+m)}{Bn}}(a+bx)(g(a+bx))^{-2-m}(i(c+dx))^{2+m}\left(e(a+bx)^n(c+dx)^{-n}\right)^{\frac{1+m}{n}}\Gamma\left(1+p,\frac{(1+m)(A+B\log(e(a+bx)^n(c}{Bn}\right.}{(bc-ad)i^2(1+m)(c+dx}$$

```
[Out] -exp(A*(1+m)/B/n)*(b*x+a)*(g*(b*x+a))^(-2-m)*(i*(d*x+c))^(2+m)*(e*(b*x+a)^n
/((d*x+c)^n))^((1+m)/n)*GAMMA(1+p,(1+m)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/B
/n)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(-a*d+b*c)/i^2/(1+m)/(d*x+c)/(((1+m
)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/B/n)^p)
```

Rubi [A]

time = 0.30, antiderivative size = 194, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {2573, 2563, 2347, 2212}

$$-\frac{(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e(a+bx)^n(c+dx)^{-n}\right)^{\frac{m+1}{n}}\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^p\left(\frac{(m+1)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{Bn}\right)^{-p}\text{Gamma}\left(p+1,\frac{(m+1)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{Bn}\right)}{i^2(m+1)(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])^p,x]
```

```
[Out] -((E^((A*(1 + m))/(B*n))*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2
+ m)*((e*(a + b*x)^n)/(c + d*x)^n)^((1 + m)/n)*Gamma[1 + p, ((1 + m)*(A + B
*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(B*n)]*(A + B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])^p)/((b*c - a*d)*i^2*(1 + m)*(c + d*x)*(((1 + m)*(A + B*Log[(e*(a +
 b*x)^n)/(c + d*x)^n]))/(B*n))^p))
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
q + 2, 0]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\int (227c+227dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p\,dx=\int (227c+227dx)^m(ag+bgx$$

Mathematica [F]
time = 0.27, size = 0, normalized size = 0.00

$$\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^p,x]
```

```
[Out] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^p, x]
```

Maple [F]
time = 1.44, size = 0, normalized size = 0.00

$$\int (bgx+ag)^{-2-m}(dix+ci)^m\left(A+B\ln\left(e(bx+a)^n(dx+c)^{-n}\right)\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(I*d*x + I*c)^m*(B*log((b*x + a)^n*e/(d*x
+ c)^n) + A)^p, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="fricas")
```

```
[Out] integral((I*d*x + I*c)^m*(cosh(-p*log(1/2*I*pi*B*n + B*n*log(b*x + a) - B*n
*log(I*d*x + I*c) + A + B)) - sinh(-p*log(1/2*I*pi*B*n + B*n*log(b*x + a) -
 B*n*log(I*d*x + I*c) + A + B)))*e^(-(m + 2)*log(b*x + a) - (m + 2)*log(g))
, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*(b*x+a)**n/((d*x+c)*
*n)))**p,x)
```

```
[Out] Timed out
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:Simplification assuming sageVARc near 0Simplification ass
uming sageVARc near 0Simplification assuming t_nostep near 0Simplification
assuming
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(c\,i+d\,i\,x)^m\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^p}{(a\,g+b\,g\,x)^{m+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((c*i + d*i*x)^m*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p)/(a*g + b*g
*x)^(m + 2),x)
```

```
[Out] int(((c*i + d*i*x)^m*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p)/(a*g + b*g
*x)^(m + 2), x)
```

3.228 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=45

$$\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^4}{4B(bc-ad)n}$$

```
[Out] 1/4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^4/B/(-a*d+b*c)/n
```

Rubi [A]
time = 0.14, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2561, 2339, 30}

$$\frac{\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^4}{4Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/(4*B*(b*c - a*d)*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
```

```
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)(c+dx)}\,dx=\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^4}{4B(bc-ad)n}$$

Mathematica [A]
time = 0.02, size = 43, normalized size = 0.96

$$\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^4}{4(bBcn-aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((a + b*x)*(c + d*x)),
x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/(4*(b*B*c*n - a*B*d*n))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 3.
time = 25.06, size = 64288, normalized size = 1428.62

method	result	size
risch	Expression too large to display	64288

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x,method=_RETURNVER
BOSE)
```

```
[Out] result too large to display
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 761 vs. $2(44) = 88$.
time = 0.34, size = 761, normalized size = 16.91

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x, algorithm
="maxima")
```

```
[Out] B^3*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e
/(d*x + c)^n)^3 + 3*A*B^2*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a
*d))*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*A^2*B*(log(b*x + a)/(b*c - a*d) -
 log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e/(d*x + c)^n) - (3*(n*e*log(b*x
 + a)^2 - 2*n*e*log(b*x + a)*log(d*x + c) + n*e*log(d*x + c)^2)*e^(-1)*log(
(b*x + a)^n*e/(d*x + c)^n)/(b*c - a*d) - (n^2*e^2*log(b*x + a)^3 - 3*n^2*e^
2*log(b*x + a)^2*log(d*x + c) + 3*n^2*e^2*log(b*x + a)*log(d*x + c)^2 - n^2
*e^2*log(d*x + c)^3)*e^(-2)/(b*c - a*d))*A*B^2 - 1/4*(6*(n*e*log(b*x + a)^2
 - 2*n*e*log(b*x + a)*log(d*x + c) + n*e*log(d*x + c)^2)*e^(-1)*log((b*x +
a)^n*e/(d*x + c)^n)^2/(b*c - a*d) - (4*(n^2*e^2*log(b*x + a)^3 - 3*n^2*e^2*
log(b*x + a)^2*log(d*x + c) + 3*n^2*e^2*log(b*x + a)*log(d*x + c)^2 - n^2*e
^2*log(d*x + c)^3)*e^(-1)*log((b*x + a)^n*e/(d*x + c)^n)/(b*c - a*d) - (n^3
*e^3*log(b*x + a)^4 - 4*n^3*e^3*log(b*x + a)^3*log(d*x + c) + 6*n^3*e^3*log
(b*x + a)^2*log(d*x + c)^2 - 4*n^3*e^3*log(b*x + a)*log(d*x + c)^3 + n^3*e^
3*log(d*x + c)^4)*e^(-2)/(b*c - a*d))*e^(-1))*B^3 + A^3*(log(b*x + a)/(b*c
- a*d) - log(d*x + c)/(b*c - a*d)) - 3/2*(n*e*log(b*x + a)^2 - 2*n*e*log(b*
x + a)*log(d*x + c) + n*e*log(d*x + c)^2)*A^2*B*e^(-1)/(b*c - a*d)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 306 vs. $2(44) = 88$.
time = 0.38, size = 306, normalized size = 6.80

$$\frac{B^3n^3\log(bx+a)^4 + B^3n^3\log(dx+c)^4 + 4(AB^2+B^3)n^2\log(bx+a)^3 + 6(A^2B+2AB^2+B^3)n\log(bx+a)^2 - 4(B^3n^3\log(bx+a) + (AB^2+B^3)n^2)\log(dx+c)^3 + 6(B^3n^3\log(bx+a)^2 + 2(AB^2+B^3)n^2\log(bx+a) + (A^2B+2AB^2+B^3)n)\log(dx+c)^2 + 4(A^3+3A^2B+3AB^2+B^3)\log(bx+a) - 4(B^3n^3\log(bx+a)^3 + 3(AB^2+B^3)n^2\log(bx+a)^2 + A^3+3A^2B+3AB^2+B^3 + 3(A^2B+2AB^2+B^3)n\log(bx+a))\log(dx+c)}{4(bc-ad)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x, algorithm
="fricas")
```

```
[Out] 1/4*(B^3*n^3*log(b*x + a)^4 + B^3*n^3*log(d*x + c)^4 + 4*(A*B^2 + B^3)*n^2*
log(b*x + a)^3 + 6*(A^2*B + 2*A*B^2 + B^3)*n*log(b*x + a)^2 - 4*(B^3*n^3*lo
g(b*x + a) + (A*B^2 + B^3)*n^2)*log(d*x + c)^3 + 6*(B^3*n^3*log(b*x + a)^2
+ 2*(A*B^2 + B^3)*n^2*log(b*x + a) + (A^2*B + 2*A*B^2 + B^3)*n)*log(d*x + c
)^2 + 4*(A^3 + 3*A^2*B + 3*A*B^2 + B^3)*log(b*x + a) - 4*(B^3*n^3*log(b*x +
 a)^3 + 3*(A*B^2 + B^3)*n^2*log(b*x + a)^2 + A^3 + 3*A^2*B + 3*A*B^2 + B^3
+ 3*(A^2*B + 2*A*B^2 + B^3)*n*log(b*x + a))*log(d*x + c))/(b*c - a*d)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)/(d*x+c),x)
```

```
[Out] Exception raised: HeuristicGCDFailed >> no luck
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x, algorithm
="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/((b*x + a)*(d*x + c)), x
)
```

Mupad [B]
time = 5.75, size = 141, normalized size = 3.13

$$-\frac{\frac{3\,A^2\,B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)^2}{2}+A\,B^2\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)^3+\frac{B^3\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)^4}{4}}{n\,\left(a\,d-b\,c\right)}+\frac{A^3\,\mathrm{atan}\left(\frac{a\,d\,1\mathrm{i}+b\,c\,1\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}\right)\,2\mathrm{i}}{a\,d-b\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/((a + b*x)*(c + d*x)),x)
```

```
[Out] (A^3*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(a*d - b*c) - ((B^3
*log((e*(a + b*x)^n)/(c + d*x)^n)^4)/4 + (3*A^2*B*log((e*(a + b*x)^n)/(c +
d*x)^n)^2)/2 + A*B^2*log((e*(a + b*x)^n)/(c + d*x)^n)^3)/(n*(a*d - b*c))
```

3.229 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=45

$$\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{3B(bc-ad)n}$$

```
[Out] 1/3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/B/(-a*d+b*c)/n
```

Rubi [A]
time = 0.14, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2561, 2339, 30}

$$\frac{\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^3}{3Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(3*B*(b*c - a*d)*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
```

```
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(a+bx)(c+dx)}\,dx=\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{3B(bc-ad)n}$$

Mathematica [A]
time = 0.01, size = 43, normalized size = 0.96

$$\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{3(bBcn-aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/((a + b*x)*(c + d*x)),
x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(3*(b*B*c*n - a*B*d*n))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 3.
time = 2.84, size = 11062, normalized size = 245.82

method	result	size
risch	Expression too large to display	11062

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)/(d*x+c),x,method=_RETURNVER
BOSE)
```

```
[Out] result too large to display
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 389 vs. 2(44) = 88.
time = 0.31, size = 389, normalized size = 8.64

$$B^2\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)^2+2\,AB\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)-\frac{1}{3}\left(\frac{3\left(ne\log(bx+a)^2-2\,ne\log(bx+a)\log(dx+c)+ne\log(dx+c)^2\right)e^{(-1)}\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)}{bc-ad}-\frac{\left(n^2e^2\log(bx+a)^3-3\,n^2e^2\log(bx+a)^2\log(dx+c)+3\,n^2e^2\log(bx+a)\log(dx+c)^2-n^2e^2\log(dx+c)^3\right)e^{(-2)}}{bc-ad}\right)B^2+A^2\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)-\frac{\left(ne\log(bx+a)^2-2\,ne\log(bx+a)\log(dx+c)+ne\log(dx+c)^2\right)ABe^{(-1)}}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)/(d*x+c),x, algorithm
="maxima")
```

```
[Out] B^2*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e
/(d*x + c)^n)^2 + 2*A*B*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d
))*log((b*x + a)^n*e/(d*x + c)^n) - 1/3*(3*(n*e*log(b*x + a)^2 - 2*n*e*log(
b*x + a)*log(d*x + c) + n*e*log(d*x + c)^2)*e^(-1)*log((b*x + a)^n*e/(d*x +
 c)^n)/(b*c - a*d) - (n^2*e^2*log(b*x + a)^3 - 3*n^2*e^2*log(b*x + a)^2*log
(d*x + c) + 3*n^2*e^2*log(b*x + a)*log(d*x + c)^2 - n^2*e^2*log(d*x + c)^3)
*e^(-2)/(b*c - a*d))*B^2 + A^2*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*
c - a*d)) - (n*e*log(b*x + a)^2 - 2*n*e*log(b*x + a)*log(d*x + c) + n*e*log
(d*x + c)^2)*A*B*e^(-1)/(b*c - a*d)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 164 vs. $2(44) = 88$.
time = 0.37, size = 164, normalized size = 3.64

$$\frac{B^2n^2\log(bx+a)^3 - B^2n^2\log(dx+c)^3 + 3(AB+B^2)n\log(bx+a)^2 + 3(B^2n^2\log(bx+a) + (AB+B^2)n)\log(dx+c)^2 + 3(A^2+2AB+B^2)\log(bx+a) - 3\left(B^2n^2\log(bx+a)^2 + 2(AB+B^2)n\log(bx+a) + A^2 + 2AB + B^2\right)\log(dx+c)}{3(bc-ad)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)/(d*x+c),x, algorithm
="fricas")
```

```
[Out] 1/3*(B^2*n^2*log(b*x + a)^3 - B^2*n^2*log(d*x + c)^3 + 3*(A*B + B^2)*n*log(
b*x + a)^2 + 3*(B^2*n^2*log(b*x + a) + (A*B + B^2)*n)*log(d*x + c)^2 + 3*(A
^2 + 2*A*B + B^2)*log(b*x + a) - 3*(B^2*n^2*log(b*x + a)^2 + 2*(A*B + B^2)*
n*log(b*x + a) + A^2 + 2*A*B + B^2)*log(d*x + c))/(b*c - a*d)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)/(d*x+c),x)
```

```
[Out] Exception raised: HeuristicGCDFailed >> no luck
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)/(d*x+c),x, algorithm
="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/((b*x + a)*(d*x + c)), x
)
```

Mupad [B]
time = 4.77, size = 100, normalized size = 2.22

$$-\frac{-6\mathrm{i}\,n\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,A^2+3\,A\,B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)^2+B^2\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)^3}{3\,n\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/((a + b*x)*(c + d*x)),x)
```

```
[Out] -(B^2*log((e*(a + b*x)^n)/(c + d*x)^n)^3 + 3*A*B*log((e*(a + b*x)^n)/(c + d
*x)^n)^2 - A^2*n*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*6i)/(3*n*(a*d -
 b*c))
```

3.230 $\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=45

$$\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{2B(bc-ad)n}$$

```
[Out] 1/2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/B/(-a*d+b*c)/n
```

Rubi [A]
time = 0.10, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.079$, Rules used = {2573, 2561, 2338}

$$\frac{\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{2Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(2*B*(b*c - a*d)*n)
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(c+dx)}\,dx=\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{2B(bc-ad)n}$$

Mathematica [A]
time = 0.01, size = 43, normalized size = 0.96

$$\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{2(bBcn-aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(2*(b*B*c*n - a*B*d*n))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 3.
time = 0.65, size = 1152, normalized size = 25.60

method	result	size
risch	Expression too large to display	1152

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)/(d*x+c),x,method=_RETURNVERBO
SE)
```

```
[Out] 1/2/(a*d-b*c)*B*n*ln(d*x+c)^2-1/(a*d-b*c)*B*ln(b*x+a)*ln(e)-1/(a*d-b*c)*B*l
n((b*x+a)^n)*ln(b*x+a)+1/(a*d-b*c)*B*ln(-d*x-c)*ln(e)+1/(a*d-b*c)*B*ln((b*x
+a)^n)*ln(d*x+c)+B*(ln(b*x+a)-ln(d*x+c))/(a*d-b*c)*ln((d*x+c)^n)-A/(a*d-b*c
)*ln(b*x+a)+1/(a*d-b*c)*A*ln(-d*x-c)+1/2/(a*d-b*c)*B*n*ln(b*x+a)^2-1/2*I/(a
*d-b*c)*B*Pi*ln(b*x+a)*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/
2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^
n))^2-1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I*e)*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/(a*d-b*c)*B*ln(-d*x-c)*Pi*csgn(I*(b*x+a)^n)
*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/(a*d-b*c)*B*ln(-d*x-c)*Pi*csgn(I/((d
*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/(a*d-b*c)*B*ln(-d*x-c)*Pi*c
sgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/(a*d-b
*c)*B*ln(-d*x-c)*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/(a*d-
b*c)*B*Pi*ln(b*x+a)*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/
((d*x+c)^n))+1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I*e)*csgn(I*(b*x+a)^n/((d*
x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I/(a*d-b*c)*B*ln(-d*x-c)*Pi*cs
gn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I/(a*
```

```
d-b*c)*B*ln(-d*x-c)*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)-1/(a*d-b*c)*B*n*ln(b*x+a)*ln(d*x+c)+1/2*I/(a*d-b*c)*B*P
i*ln(b*x+a)*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I/(a*d-b*c)*B*ln(-d*x-c)*Pi*csgn(I*(b
*x+a)^n/((d*x+c)^n))^3-1/2*I/(a*d-b*c)*B*ln(-d*x-c)*Pi*csgn(I*e/((d*x+c)^n)
*(b*x+a)^n)^3
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 154 vs. $2(44) = 88$.
time = 0.27, size = 154, normalized size = 3.42

$$B\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)-\frac{\left(ne\log(bx+a)^2-2\,ne\log(bx+a)\log(dx+c)+ne\log(dx+c)^2\right)Be^{(-1)}}{2\,(bc-ad)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)/(d*x+c),x, algorithm="
maxima")
```

```
[Out] B*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e/(
d*x + c)^n) + A*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d)) - 1/2
*(n*e*log(b*x + a)^2 - 2*n*e*log(b*x + a)*log(d*x + c) + n*e*log(d*x + c)^2
)*B*e^(-1)/(b*c - a*d)
```

Fricas [A]
time = 0.39, size = 66, normalized size = 1.47

$$\frac{Bn\log(bx+a)^2+Bn\log(dx+c)^2+2\,(A+B)\log(bx+a)-2\,(Bn\log(bx+a)+A+B)\log(dx+c)}{2\,(bc-ad)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)/(d*x+c),x, algorithm="
fricas")
```

```
[Out] 1/2*(B*n*log(b*x + a)^2 + B*n*log(d*x + c)^2 + 2*(A + B)*log(b*x + a) - 2*(
B*n*log(b*x + a) + A + B)*log(d*x + c))/(b*c - a*d)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)/(d*x+c),x)
```

```
[Out] Exception raised: HeuristicGCDFailed >> no luck
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)/(d*x+c),x, algorithm="
giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/((b*x + a)*(d*x + c)), x)
```

Mupad [B]
time = 4.67, size = 71, normalized size = 1.58

$$-\frac{B\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)^2-A\,n\,\mathrm{atan}\left(\frac{b\,c\,2{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}+1{}\mathrm{i}\right)\,4{}\mathrm{i}}{2\,n\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/((a + b*x)*(c + d*x)),x)
```

```
[Out] -(B*log((e*(a + b*x)^n)/(c + d*x)^n)^2 - A*n*atan((b*c*2i + b*d*x*2i)/(a*d
- b*c) + 1i)*4i)/(2*n*(a*d - b*c))
```

3.231 $\int \frac{1}{(a+bx)(c+dx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=41

$$\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)n}$$

```
[Out] ln(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/B/(-a*d+b*c)/n
```

Rubi [A]
time = 0.16, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2561, 2339, 29}

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*n)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
```

```
rQ[n]
```

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx=\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)n}$$

Mathematica [A]
time = 0.04, size = 39, normalized size = 0.95

$$\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{bBcn-aBdn}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),
x]
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(b*B*c*n - a*B*d*n)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 3.
time = 0.36, size = 368, normalized size = 8.98

method	result
risch	$-\frac{\ln\left(\ln((dx+c)^n)-\frac{-iB\pi\,\mathrm{csgn}(ie)\mathrm{csgn}\left(i(bx+a)^n(dx+c)^{-n}\right)\mathrm{csgn}\left(ie(dx+c)^{-n}(bx+a)^n\right)+iB\pi\,\mathrm{csgn}(ie)\mathrm{csgn}\left(ie(dx+c)^{-n}(bx+a)^n\right)^2-iB\pi\,\mathrm{csgn}(i(b}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x,method=_RETURNVER
BOSE)
[Out] -1/B/n/(a*d-b*c)*ln(ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*
x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^
2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*
(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*
x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)+2*B
*ln((b*x+a)^n)+2*A)/B)
```

Maxima [A]
time = 0.38, size = 46, normalized size = 1.12

$$\frac{\log\left(-\frac{B\log\left((bx+a)^n\right)-B\log\left((dx+c)^n\right)+A+B}{B}\right)}{(bcn-adn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="maxima")
```

```
[Out] log(-(B*log((b*x + a)^n) - B*log((d*x + c)^n) + A + B)/B)/((b*c*n - a*d*n)*
B)
```

Fricas [A]
time = 0.36, size = 43, normalized size = 1.05

$$\frac{\log\left(-Bn\log\left(bx+a\right)+Bn\log\left(dx+c\right)-A-B\right)}{\left(Bbc-Bad\right)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="fricas")
```

```
[Out] log(-B*n*log(b*x + a) + B*n*log(d*x + c) - A - B)/((B*b*c - B*a*d)*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [A]
time = 4.83, size = 38, normalized size = 0.93

$$\frac{\log\left(Bn\log\left(bx+a\right)-Bn\log\left(dx+c\right)+A+B\right)}{Bbcn-Badn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="giac")
```

```
[Out] log(B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)/(B*b*c*n - B*a*d*n)
```

Mupad [B]
time = 4.66, size = 40, normalized size = 0.98

$$-\frac{\ln\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}{B\,a\,d\,n-B\,b\,c\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(a + b*x)*(c + d*x)),x)
```

```
[Out] -log(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(B*a*d*n - B*b*c*n)
```

3.232 $\int \frac{1}{(a+bx)(c+dx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2} dx$

Optimal. Leaf size=43

$$-\frac{1}{B(bc-ad)n\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}$$

[Out] -1/B/(-a*d+b*c)/n/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))

Rubi [A]
time = 0.15, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2561, 2339, 30}

$$-\frac{1}{Bn(bc-ad)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2),x]

[Out] -(1/(B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
```

rQ[n]

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx = -\frac{1}{B(bc-ad)n\left(A+B\log\left(e(a+bx)^n(c+dx\right.\right.}$$

Mathematica [A]
time = 0.02, size = 41, normalized size = 0.95

$$-\frac{1}{(bBcn-aBdn)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2
),x]
```

```
[Out] -(1/((b*B*c*n - a*B*d*n)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 3.
time = 0.38, size = 366, normalized size = 8.51

method	result
risch	$\overline{Bn(ad-cb)\left(2A+2B\ln(e)+2B\ln((bx+a)^n)-2B\ln((dx+c)^n)-iB\pi\,\text{csgn}(i(bx+a)^n)\text{csgn}\left(i(dx+c)^{-n}\right)\text{csgn}\left(i(bx+a)^n(dx+c)^{-n}\right)+i\right.}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x,method=_RETURNV
ERBOSE)
```

```
[Out] 2/B/n/(a*d-b*c)/(2*A+2*B*ln(e)+2*B*ln((b*x+a)^n)-2*B*ln((d*x+c)^n)-I*B*Pi*c
sgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*c
sgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*csgn(I/((d*x+c)^n))
*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B
*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*csgn(I*(b*x+a)^n
/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)
*(b*x+a)^n)^3)
```

Maxima [A]
time = 0.40, size = 77, normalized size = 1.79

$$-\frac{1}{(bcn-adn)B^2\log\left((bx+a)^n\right)-(bcn-adn)B^2\log\left((dx+c)^n\right)+(bcn-adn)AB+(bcn-adn)B^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorit
hm="maxima")
```

```
[Out] -1/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c
)^n) + (b*c*n - a*d*n)*A*B + (b*c*n - a*d*n)*B^2)
```

Fricas [A]
time = 0.40, size = 78, normalized size = 1.81

$$-\frac{1}{(B^2bc-B^2ad)n^2\log(bx+a)-(B^2bc-B^2ad)n^2\log(dx+c)+((AB+B^2)bc-(AB+B^2)ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorit
hm="fricas")
```

```
[Out] -1/((B^2*b*c - B^2*a*d)*n^2*log(b*x + a) - (B^2*b*c - B^2*a*d)*n^2*log(d*x
+ c) + ((A*B + B^2)*b*c - (A*B + B^2)*a*d)*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 95 vs. $2(44) = 88$.
time = 4.29, size = 95, normalized size = 2.21

$$-\frac{1}{B^2bcn^2\log(bx+a)-B^2adn^2\log(bx+a)-B^2bcn^2\log(dx+c)+B^2adn^2\log(dx+c)+ABbcn+B^2bcn-ABadn-B^2adn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorit
hm="giac")
```

```
[Out] -1/(B^2*b*c*n^2*log(b*x + a) - B^2*a*d*n^2*log(b*x + a) - B^2*b*c*n^2*log(d
*x + c) + B^2*a*d*n^2*log(d*x + c) + A*B*b*c*n + B^2*b*c*n - A*B*a*d*n - B^
2*a*d*n)
```

Mupad [B]
time = 4.49, size = 42, normalized size = 0.98

$$\frac{1}{B\,n\,\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2*(a + b*x)*(c + d*x)),x)
[Out] 1/(B*n*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(a*d - b*c))
```

3.233 $\int \frac{1}{(a+bx)(c+dx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}\,dx$

Optimal. Leaf size=45

$$-\frac{1}{2B(bc-ad)n\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}$$

```
[Out] -1/2/B/(-a*d+b*c)/n/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2
```

Rubi [A]
time = 0.15, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2561, 2339, 30}

$$-\frac{1}{2Bn(bc-ad)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3),x]
```

```
[Out] -1/2*1/(B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
```

```
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}\,dx = -\frac{1}{2B(bc-ad)n\left(A+B\log\left(e(a+bx)^n(c+\right.\right.}$$

Mathematica [A]
time = 0.02, size = 43, normalized size = 0.96

$$-\frac{1}{2(bBcn-aBdn)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3
),x]
```

```
[Out] -1/2*1/((b*B*c*n - a*B*d*n)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 3.
time = 0.34, size = 366, normalized size = 8.13

method	result
risch	$\frac{}{Bn(ad-cb)\left(2A+2B\ln(e)+2B\ln((bx+a)^n)-2B\ln((dx+c)^n)-iB\pi\,\mathrm{csgn}(i(bx+a)^n)\mathrm{csgn}\left(i(dx+c)^{-n}\right)\mathrm{csgn}\left(i(bx+a)^n(dx+c)^{-n}\right)+i\right.}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x,method=_RETURNV
ERBOSE)
```

```
[Out] 2/B/n/(a*d-b*c)/(2*A+2*B*ln(e)+2*B*ln((b*x+a)^n)-2*B*ln((d*x+c)^n)-I*B*Pi*c
sgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*c
sgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*csgn(I/((d*x+c)^n))
*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B
*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*csgn(I*(b*x+a)^n
/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)
*(b*x+a)^n)^3)^2
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 200 vs. $2(44) = 88$.
time = 0.43, size = 200, normalized size = 4.44

$$-\frac{1}{2\left((bcn-adn)B^3\log\left((bx+a)^n\right)^2+(bcn-adn)B^3\log\left((dx+c)^n\right)^2+(bcn-adn)A^2B+2\,(bcn-adn)AB^2+(bcn-adn)B^3+2\left((bcn-adn)AB^2+(bcn-adn)B^3\right)\log\left((bx+a)^n\right)-2\left((bcn-adn)B^3\log\left((bx+a)^n\right)+(bcn-adn)AB^2+(bcn-adn)B^3\right)\log\left((dx+c)^n\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorit
hm="maxima")
```

```
[Out] -1/2/((b*c*n - a*d*n)*B^3*log((b*x + a)^n)^2 + (b*c*n - a*d*n)*B^3*log((d*x
 + c)^n)^2 + (b*c*n - a*d*n)*A^2*B + 2*(b*c*n - a*d*n)*A*B^2 + (b*c*n - a*d
*n)*B^3 + 2*((b*c*n - a*d*n)*A*B^2 + (b*c*n - a*d*n)*B^3)*log((b*x + a)^n)
- 2*((b*c*n - a*d*n)*B^3*log((b*x + a)^n) + (b*c*n - a*d*n)*A*B^2 + (b*c*n
- a*d*n)*B^3)*log((d*x + c)^n))
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 197 vs. $2(44) = 88$.
time = 0.34, size = 197, normalized size = 4.38

$$-\frac{1}{2\left(\left(B^3bc - B^3ad\right)n^3\log\left(bx+a\right)^2 + \left(B^3bc - B^3ad\right)n^3\log\left(dx+c\right)^2 + 2\left(\left(AB^2+B^3\right)bc - \left(AB^2+B^3\right)ad\right)n^2\log\left(bx+a\right) + \left(\left(A^2B + 2\,AB^2 + B^3\right)bc - \left(A^2B + 2\,AB^2 + B^3\right)ad\right)n - 2\left(\left(B^3bc - B^3ad\right)n^3\log\left(bx+a\right) + \left(\left(AB^2+B^3\right)bc - \left(AB^2+B^3\right)ad\right)n^2\right)\log\left(dx+c\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorit
hm="fricas")
```

```
[Out] -1/2/((B^3*b*c - B^3*a*d)*n^3*log(b*x + a)^2 + (B^3*b*c - B^3*a*d)*n^3*log(
d*x + c)^2 + 2*((A*B^2 + B^3)*b*c - (A*B^2 + B^3)*a*d)*n^2*log(b*x + a) + (
(A^2*B + 2*A*B^2 + B^3)*b*c - (A^2*B + 2*A*B^2 + B^3)*a*d)*n - 2*((B^3*b*c
- B^3*a*d)*n^3*log(b*x + a) + ((A*B^2 + B^3)*b*c - (A*B^2 + B^3)*a*d)*n^2)*
log(d*x + c))
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Timed out
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 301 vs. $2(44) = 88$.
time = 3.70, size = 301, normalized size = 6.69

$$-\frac{1}{2\left(B^3bcn^3\log\left(bx+a\right)^2 - B^3adn^3\log\left(bx+a\right)^2 - 2\,B^3bcn^3\log\left(bx+a\right)\log\left(dx+c\right) + 2\,B^3adn^3\log\left(bx+a\right)\log\left(dx+c\right) + B^3bcn^3\log\left(dx+c\right)^2 - B^3adn^3\log\left(dx+c\right)^2 + 2\,AB^2bcn^2\log\left(bx+a\right) + 2\,B^3bcn^2\log\left(bx+a\right) - 2\,AB^2adn^2\log\left(bx+a\right) - 2\,B^3adn^2\log\left(bx+a\right) - 2\,AB^2bcn^2\log\left(dx+c\right) - 2\,B^3bcn^2\log\left(dx+c\right) + 2\,AB^2adn^2\log\left(dx+c\right) + 2\,B^3adn^2\log\left(dx+c\right) + A^2Bbcn + 2\,AB^2bcn + B^3bcn - A^2Badn - 2\,AB^2adn - B^3adn\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorit
hm="giac")
```

```
[Out] -1/2/(B^3*b*c*n^3*log(b*x + a)^2 - B^3*a*d*n^3*log(b*x + a)^2 - 2*B^3*b*c*n
^3*log(b*x + a)*log(d*x + c) + 2*B^3*a*d*n^3*log(b*x + a)*log(d*x + c) + B^
3*b*c*n^3*log(d*x + c)^2 - B^3*a*d*n^3*log(d*x + c)^2 + 2*A*B^2*b*c*n^2*log
(b*x + a) + 2*B^3*b*c*n^2*log(b*x + a) - 2*A*B^2*a*d*n^2*log(b*x + a) - 2*B
^3*a*d*n^2*log(b*x + a) - 2*A*B^2*b*c*n^2*log(d*x + c) - 2*B^3*b*c*n^2*log(
d*x + c) + 2*A*B^2*a*d*n^2*log(d*x + c) + 2*B^3*a*d*n^2*log(d*x + c) + A^2*
B*b*c*n + 2*A*B^2*b*c*n + B^3*b*c*n - A^2*B*a*d*n - 2*A*B^2*a*d*n - B^3*a*d
*n)
```

Mupad [B]
time = 4.54, size = 72, normalized size = 1.60

$$\frac{1}{2\,B\,n\,\left(a\,d-b\,c\right)\,\left(A^2+2\,A\,B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)+B^2\,{\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)}^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3*(a + b*x)*(c + d*x)),x)
```

```
[Out] 1/(2*B*n*(a*d - b*c)*(B^2*log((e*(a + b*x)^n)/(c + d*x)^n)^2 + A^2 + 2*A*B*
log((e*(a + b*x)^n)/(c + d*x)^n)))
```

3.234 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{(a+bx)(c+dx)} dx$

Optimal. Leaf size=49

$$\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)n(1+p)}$$

```
[Out] (A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^(1+p)/B/(-a*d+b*c)/n/(1+p)
```

Rubi [A]
time = 0.19, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2561, 2339, 30}

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^{p+1}}{Bn(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(B*(b*c - a*d)*n*(1 + p))
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
```

```
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{(a+bx)(c+dx)}\,dx = \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)n(1+p)}$$

Mathematica [A]
time = 0.02, size = 47, normalized size = 0.96

$$\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{(bBcn-aBdn)(1+p)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/((a + b*x)*(c + d*x)),
x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/((b*B*c*n - a*B*d*n)*(1 +
p))
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e(bx+a)^n\,(dx+c)^{-n}\right)\right)^p}{(bx+a)\,(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x, algorithm
="maxima")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/((b*x + a)*(d*x + c)), x
)
```

Fricas [A]
time = 0.39, size = 75, normalized size = 1.53

$$\frac{(Bn\log(bx+a) - Bn\log(dx+c) + A + B)(Bn\log(bx+a) - Bn\log(dx+c) + A + B)^p}{(Bbc - Bad)np + (Bbc - Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x, algorithm
="fricas")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)*(B*n*log(b*x + a) - B*n*log(d
*x + c) + A + B)^p/((B*b*c - B*a*d)*n*p + (B*b*c - B*a*d)*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**p/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [A]
time = 4.48, size = 46, normalized size = 0.94

$$\frac{(Bn\log(bx+a) - Bn\log(dx+c) + A + B)^{p+1}}{(Bbcn - Badn)(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x, algorithm
="giac")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)^(p + 1)/((B*b*c*n - B*a*d*n)*
(p + 1))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(A + B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^p}{(a+b\,x)\,(c+d\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p/((a + b*x)*(c + d*x)),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p/((a + b*x)*(c + d*x)), x)
```

3.235 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p}{(af+bfx)(cg+dgx)}\,dx$

Optimal. Leaf size=55

$$\frac{(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right))^{1+p}}{B(bc-ad)fgn(1+p)}$$

```
[Out] (A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^(1+p)/B/(-a*d+b*c)/f/g/n/(1+p)
```

Rubi [A]
time = 0.24, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 46, $\frac{\text{number of rules}}{\text{integrand size}} = 0.087$, Rules used = {2573, 2561, 2339, 30}

$$\frac{(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)^{p+1}}{Bfgn(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/((a*f + b*f*x)*(c*g + d*g*x)
),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(B*(b*c - a*d)*f*g*n*(1 +
p))
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{(af+bfx)(cg+dgx)}\,dx=\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)fgn(1+p)}$$

Mathematica [A]
time = 0.04, size = 51, normalized size = 0.93

$$\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{(bBcfgn-aBdfgn)(1+p)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/((a*f + b*f*x)*(c*g +
d*g*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/((b*B*c*f*g*n - a*B*d*f*g*
n)*(1 + p))
```

Maple [F]
time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e(bx+a)^n\,(dx+c)^{-n}\right)\right)^p}{(bfx+af)\,(dgx+cg)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x, a
lgorithm="maxima")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/((b*f*x + a*f)*(d*g*x +
c*g)), x)
```

Fricas [A]
time = 0.36, size = 79, normalized size = 1.44

$$\frac{(Bn\log(bx+a)-Bn\log(dx+c)+A+B)(Bn\log(bx+a)-Bn\log(dx+c)+A+B)^p}{(Bbc-Bad)fgnp+(Bbc-Bad)fgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x, a
lgorithm="fricas")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)*(B*n*log(b*x + a) - B*n*log(d
*x + c) + A + B)^p/((B*b*c - B*a*d)*f*g*n*p + (B*b*c - B*a*d)*f*g*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**p/(b*f*x+a*f)/(d*g*x+c*g),x)
```

```
[Out] Timed out
```

Giac [A]
time = 4.35, size = 50, normalized size = 0.91

$$\frac{(Bn\log(bx+a)-Bn\log(dx+c)+A+B)^{p+1}}{(Bbcfgn-Badfgn)(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x, a
lgorithm="giac")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)^(p + 1)/((B*b*c*f*g*n - B*a*d
*f*g*n)*(p + 1))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^p}{(a\,f+b\,f\,x)\,(c\,g+d\,g\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p/((a*f + b*f*x)*(c*g + d*g*x)
),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p/((a*f + b*f*x)*(c*g + d*g*x)
), x)
```

3.236 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{acf+(bc+ad)fx+bdfx^2}\,dx$

Optimal. Leaf size=52

$$\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)fn(1+p)}$$

```
[Out] (A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^(1+p)/B/(-a*d+b*c)/f/n/(1+p)
```

Rubi [A]

time = 0.18, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2574, 2561, 2339, 30}

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^{p+1}}{Bfn(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/(a*c*f + (b*c + a*d)*f*x + b
*d*f*x^2),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(B*(b*c - a*d)*f*n*(1 + p)
)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rule 2574

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_) + (h_.)*(x_)^2)^(m_.), x_Symbol] :> Dist[h^
m/(b^m*d^m), Int[(a + b*x)^m*(c + d*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, n, p}, x] && EqQ[b*d
*f - a*c*h, 0] && EqQ[b*d*g - h*(b*c + a*d), 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{acf+(bc+ad)fx+bdfx^2}\,dx=\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)fn(1+p)}$$

Mathematica [A]
time = 0.01, size = 50, normalized size = 0.96

$$\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{f(bBcn-aBdn)(1+p)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/(a*c*f + (b*c + a*d)*f
*x + b*d*f*x^2),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(f*(b*B*c*n - a*B*d*n)*(1
+ p))
```

Maple [F]
time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e(bx+a)^n\,(dx+c)^{-n}\right)\right)^p}{acf+(ad+cb)\,fx+bdf\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x
^2),x, algorithm="maxima")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/(b*d*f*x^2 + a*c*f + (b*
c + a*d)*f*x), x)
```

Fricas [**A**]
time = 0.38, size = 77, normalized size = 1.48

$$\frac{(Bn\log{(bx+a)}-Bn\log{(dx+c)}+A+B)(Bn\log{(bx+a)}-Bn\log{(dx+c)}+A+B)^p}{(Bbc-Bad)fnp+(Bbc-Bad)fn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x
^2),x, algorithm="fricas")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)*(B*n*log(b*x + a) - B*n*log(d
*x + c) + A + B)^p/((B*b*c - B*a*d)*f*n*p + (B*b*c - B*a*d)*f*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**p/(a*c*f+(a*d+b*c)*f*x+b*d*f
*x**2),x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 4.52, size = 48, normalized size = 0.92

$$\frac{(Bn\log{(bx+a)}-Bn\log{(dx+c)}+A+B)^{p+1}}{(Bbcfn-Badfn)(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x
^2),x, algorithm="giac")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)^(p + 1)/((B*b*c*f*n - B*a*d*f
*n)*(p + 1))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)^p}{b\,d\,f\,x^2+f\,\left(a\,d+b\,c\right)\,x+a\,c\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p/(a*c*f + f*x*(a*d + b*c) + b
*d*f*x^2),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^p/(a*c*f + f*x*(a*d + b*c) + b
*d*f*x^2), x)
```

3.237 $\int \frac{1}{(a+bx)(c+dx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))} dx$

Optimal. Leaf size=41

$$\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)n}$$

```
[Out] ln(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/B/(-a*d+b*c)/n
```

Rubi [A]
time = 0.16, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2561, 2339, 29}

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*n)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
```

```
rQ[n]
```

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx = \frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)n}$$

Mathematica [A]
time = 0.02, size = 39, normalized size = 0.95

$$\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{bBcn-aBdn}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),
x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(b*B*c*n - a*B*d*n)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 3.
time = 0.26, size = 368, normalized size = 8.98

method	result
risch	$-\frac{\ln\left(\ln((dx+c)^n)-\frac{-iB\pi\,\mathrm{csgn}(ie)\mathrm{csgn}\left(i(bx+a)^n(dx+c)^{-n}\right)\mathrm{csgn}\left(ie(dx+c)^{-n}(bx+a)^n\right)+iB\pi\,\mathrm{csgn}(ie)\mathrm{csgn}\left(ie(dx+c)^{-n}(bx+a)^n\right)^2-iB\pi\,\mathrm{csgn}(}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x,method=_RETURNVER
BOSE)
```

```
[Out] -1/B/n/(a*d-b*c)*ln(ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*
x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^
2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*
(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*
x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)+2*B
*ln((b*x+a)^n)+2*A)/B)
```

Maxima [A]
time = 0.38, size = 46, normalized size = 1.12

$$\frac{\log\left(-\frac{B\log\left((bx+a)^n\right)-B\log\left((dx+c)^n\right)+A+B}{B}\right)}{(bcn-adn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="maxima")
```

```
[Out] log(-(B*log((b*x + a)^n) - B*log((d*x + c)^n) + A + B)/B)/((b*c*n - a*d*n)*
B)
```

Fricas [A]
time = 0.38, size = 43, normalized size = 1.05

$$\frac{\log\left(-Bn\log\left(bx+a\right)+Bn\log\left(dx+c\right)-A-B\right)}{(Bbc-Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="fricas")
```

```
[Out] log(-B*n*log(b*x + a) + B*n*log(d*x + c) - A - B)/((B*b*c - B*a*d)*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.45, size = 38, normalized size = 0.93

$$\frac{\log\left(Bn\log\left(bx+a\right)-Bn\log\left(dx+c\right)+A+B\right)}{Bbcn-Badn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="giac")
```

```
[Out] log(B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)/(B*b*c*n - B*a*d*n)
```

Mupad [B]
time = 0.00, size = 40, normalized size = 0.98

$$-\frac{\ln\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}{B\,a\,d\,n-B\,b\,c\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(a + b*x)*(c + d*x)),x)
```

```
[Out] -log(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(B*a*d*n - B*b*c*n)
```

3.238 $\int \frac{1}{(af+bfx)(cg+dgx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=47

$$\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)fgn}$$

```
[Out] ln(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/B/(-a*d+b*c)/f/g/n
```

Rubi [A]
time = 0.21, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 46, $\frac{\text{number of rules}}{\text{integrand size}} = 0.087$, Rules used = {2573, 2561, 2339, 29}

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bfgn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a*f + b*f*x)*(c*g + d*g*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])
),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*f*g*n)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
```

```
rQ[n]
```

Rubi steps

$$\int \frac{1}{(af+bfx)(cg+dgx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx = \frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)fgn}$$

Mathematica [A]
time = 0.05, size = 43, normalized size = 0.91

$$\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{bBcfgn-aBdfgn}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*f + b*f*x)*(c*g + d*g*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*
x)^n])),x]
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(b*B*c*f*g*n - a*B*d*f*g*n)
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 3.
time = 0.31, size = 374, normalized size = 7.96

method	result
risch	$-\frac{\ln\left(\ln((dx+c)^n)-\frac{-iB\pi\,\mathrm{csgn}(ie)\mathrm{csgn}\left(i(bx+a)^n(dx+c)^{-n}\right)\mathrm{csgn}\left(ie(dx+c)^{-n}(bx+a)^n\right)+iB\pi\,\mathrm{csgn}(ie)\mathrm{csgn}\left(ie(dx+c)^{-n}(bx+a)^n\right)^2-iB\pi\,\mathrm{csgn}(i(l}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x,method=_R
ETURNVERBOSE)
[Out] -1/B/f/g/n/(a*d-b*c)*ln(ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)
^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I
*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^
n))^2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csg
n(I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)
+2*B*ln((b*x+a)^n)+2*A)/B)
```

Maxima [A]
time = 0.38, size = 50, normalized size = 1.06

$$\frac{\log\left(-\frac{B\log((bx+a)^n)-B\log((dx+c)^n)+A+B}{B}\right)}{(bcfgn-adfgn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, a
lgorithm="maxima")
```

```
[Out] log(-(B*log((b*x + a)^n) - B*log((d*x + c)^n) + A + B)/B)/((b*c*f*g*n - a*d
*f*g*n)*B)
```

Fricas [**A**]
time = 0.37, size = 49, normalized size = 1.04

$$\frac{\log\left(-Bn\log\left(bx+a\right)+Bn\log\left(dx+c\right)-A-B\right)}{\left(Bbc-Bad\right)fgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, a
lgorithm="fricas")
```

```
[Out] log(-B*n*log(b*x + a) + B*n*log(d*x + c) - A - B)/((B*b*c - B*a*d)*f*g*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 4.34, size = 42, normalized size = 0.89

$$\frac{\log\left(Bn\log\left(bx+a\right)-Bn\log\left(dx+c\right)+A+B\right)}{Bbcfgn-Badfgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, a
lgorithm="giac")
```

```
[Out] log(B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)/(B*b*c*f*g*n - B*a*d*f*g*n
)
```

Mupad [**B**]
time = 4.43, size = 44, normalized size = 0.94

$$-\frac{\ln\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}{B\,a\,d\,f\,g\,n-B\,b\,c\,f\,g\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*f + b*f*x)*(c*g + d*g*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))
),x)
```

```
[Out] -log(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(B*a*d*f*g*n - B*b*c*f*g*n)
```

3.239 $\int \frac{1}{(acf+(bc+ad)fx+bdfx^2)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=44

$$\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)fn}$$

```
[Out] ln(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/B/(-a*d+b*c)/f/n
```

Rubi [A]
time = 0.17, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2574, 2561, 2339, 29}

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bfn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a*c*f + (b*c + a*d)*f*x + b*d*f*x^2)*(A + B*Log[(e*(a + b*x)^n)/(c
+ d*x)^n])),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*f*n)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
```

```
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rule 2574

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_) + (h_.)*(x_)^2)^(m_.), x_Symbol] :> Dist[h^
m/(b^m*d^m), Int[(a + b*x)^m*(c + d*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, A, B, n, p}, x] && EqQ[b*d
*f - a*c*h, 0] && EqQ[b*d*g - h*(b*c + a*d), 0] && IntegerQ[m]
```

Rubi steps

$$\int \frac{1}{(acf + (bc+ad)fx + bdfx^2)(A + B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx = \frac{\log(A + B\log(e(a+bx)^n(c+dx)}{B(bc-ad)fn}$$

Mathematica [A]
time = 0.02, size = 42, normalized size = 0.95

$$\frac{\log(A + B\log(e(a+bx)^n(c+dx)^{-n}))}{f(bBcn - aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*c*f + (b*c + a*d)*f*x + b*d*f*x^2)*(A + B*Log[(e*(a + b*x)^
n)/(c + d*x)^n])),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(f*(b*B*c*n - a*B*d*n))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 3.
time = 0.71, size = 371, normalized size = 8.43

method	result
risch	$-\frac{\ln\left(\ln((dx+c)^n) - \frac{-iB\pi\,\mathrm{csgn}(ie)\mathrm{csgn}\left(i(bx+a)^n(dx+c)^{-n}\right)\mathrm{csgn}\left(ie(dx+c)^{-n}(bx+a)^n\right) + iB\pi\,\mathrm{csgn}(ie)\mathrm{csgn}\left(ie(dx+c)^{-n}(bx+a)^n\right)^2 - iB\pi\,\mathrm{csgn}(i(b}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x,m
ethod=_RETURNVERBOSE)
```

```
[Out] -1/B/f/n/(a*d-b*c)*ln(ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n
/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(
```

```
b*x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n)
)^2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(
I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((
d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)+2
*B*ln((b*x+a)^n)+2*A)/B)
```

Maxima [**A**]
time = 0.40, size = 48, normalized size = 1.09

$$\frac{\log\left(-\frac{B\log\left((bx+a)^n\right)-B\log\left((dx+c)^n\right)+A+B}{B}\right)}{(bcfn-adfn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n
))),x, algorithm="maxima")
```

```
[Out] log(-(B*log((b*x + a)^n) - B*log((d*x + c)^n) + A + B)/B)/((b*c*f*n - a*d*f
*n)*B)
```

Fricas [**A**]
time = 0.35, size = 46, normalized size = 1.05

$$\frac{\log\left(-Bn\log\left(bx+a\right)+Bn\log\left(dx+c\right)-A-B\right)}{(Bbc-Bad)fn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n
))),x, algorithm="fricas")
```

```
[Out] log(-B*n*log(b*x + a) + B*n*log(d*x + c) - A - B)/((B*b*c - B*a*d)*f*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x**2)/(A+B*ln(e*(b*x+a)**n/((d*x+c)*
*n))),x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 4.20, size = 40, normalized size = 0.91

$$\frac{\log\left(Bn\log\left(bx+a\right)-Bn\log\left(dx+c\right)+A+B\right)}{Bbcfn-Badfn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n
))),x, algorithm="giac")
```

```
[Out] log(B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)/(B*b*c*f*n - B*a*d*f*n)
```

Mupad [B]
time = 4.51, size = 42, normalized size = 0.95

$$-\frac{\ln\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}{B\,a\,d\,f\,n-B\,b\,c\,f\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(a*c*f + f*x*(a*d + b*c) +
b*d*f*x^2)),x)
```

```
[Out] -log(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(B*a*d*f*n - B*b*c*f*n)
```

3.240 $\int \frac{(a+bx)^m(c+dx)^{-2-m}}{\log(e(a+bx)^n(c+dx)^{-n})}\,dx$

Optimal. Leaf size=88

$$\frac{(a+bx)^{1+m}(c+dx)^{-1-m}\left(e(a+bx)^n(c+dx)^{-n}\right)^{-\frac{1+m}{n}}\operatorname{Ei}\left(\frac{(1+m)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{n}\right)}{(bc-ad)n}$$

```
[Out] (b*x+a)^(1+m)*(d*x+c)^(-1-m)*Ei((1+m)*ln(e*(b*x+a)^n/((d*x+c)^n))/n)/(-a*d+
b*c)/n/((e*(b*x+a)^n/((d*x+c)^n))^((1+m)/n))
```

Rubi [A]
time = 0.17, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2573, 2563, 2347, 2209}

$$\frac{(a+bx)^{m+1}(c+dx)^{-m-1}\left(e(a+bx)^n(c+dx)^{-n}\right)^{-\frac{m+1}{n}}\operatorname{Ei}\left(\frac{(m+1)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{n}\right)}{n(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)^m*(c + d*x)^(-2 - m))/Log[(e*(a + b*x)^n)/(c + d*x)^n],x]
```

```
[Out] ((a + b*x)^(1 + m)*(c + d*x)^(-1 - m)*ExpIntegralEi[((1 + m)*Log[(e*(a + b*
x)^n)/(c + d*x)^n])/n])/((b*c - a*d)*n*((e*(a + b*x)^n)/(c + d*x)^n)^((1 +
m)/n))
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2563

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[d^2*((g*((a + b*x)/b))^m/(i^2*(b*c - a*d)*(i*((c + d*x)/d))^m*((a
 + b*x)/(c + d*x))^m)), Subst[Int[x^m*(A + B*Log[e*x^n])^p, x], x, (a + b*x
)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, m, n, p, q}, x]
 && NeQ[b*c - a*d, 0] && EqQ[b*f - a*g, 0] && EqQ[d*h - c*i, 0] && EqQ[m +
```

```
q + 2, 0]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\int \frac{(a+bx)^m(c+dx)^{-2-m}}{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}\,dx = \frac{(a+bx)^{1+m}(c+dx)^{-1-m}\left(e(a+bx)^n(c+dx)^{-n}\right)^{-\frac{1+m}{n}}\operatorname{Ei}\left(\frac{(1+m)\log(e(a+bx)}{n}\right.}{(bc-ad)n}$$

Mathematica [**F**]
time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{(a+bx)^m(c+dx)^{-2-m}}{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[((a + b*x)^m*(c + d*x)^(-2 - m))/Log[(e*(a + b*x)^n)/(c + d*x)^n]
,x]
```

```
[Out] Integrate[((a + b*x)^m*(c + d*x)^(-2 - m))/Log[(e*(a + b*x)^n)/(c + d*x)^n]
, x]
```

Maple [**F**]
time = 0.27, size = 0, normalized size = 0.00

$$\int \frac{(bx+a)^m\,(dx+c)^{-2-m}}{\ln\left(e\,(bx+a)^n\,(dx+c)^{-n}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^m*(d*x+c)^(-2-m)/ln(e*(b*x+a)^n/((d*x+c)^n)),x)
```

```
[Out] int((b*x+a)^m*(d*x+c)^(-2-m)/ln(e*(b*x+a)^n/((d*x+c)^n)),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(-2-m)/log(e*(b*x+a)^n/((d*x+c)^n)),x, algorith
m="maxima")
```

```
[Out] integrate((b*x + a)^m*(d*x + c)^(-m - 2)/log((b*x + a)^n*e/(d*x + c)^n), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(-2-m)/log(e*(b*x+a)^n/((d*x+c)^n)),x, algorith
m="fricas")
```

```
[Out] integral((b*x + a)^m*(d*x + c)^(-m - 2)/log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**m*(d*x+c)**(-2-m)/ln(e*(b*x+a)**n/((d*x+c)**n)),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(-2-m)/log(e*(b*x+a)^n/((d*x+c)^n)),x, algorith
m="giac")
```

```
[Out] integrate((b*x + a)^m*(d*x + c)^(-m - 2)/log((b*x + a)^n*e/(d*x + c)^n), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,x)^m}{\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\,(c+d\,x)^{m+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*x)^m/(log((e*(a + b*x)^n)/(c + d*x)^n)*(c + d*x)^(m + 2)),x)
```

```
[Out] int((a + b*x)^m/(log((e*(a + b*x)^n)/(c + d*x)^n)*(c + d*x)^(m + 2)), x)
```

3.241 $\int \frac{(a+bx)^3}{(c+dx)^5 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$

Optimal. Leaf size=75

$$\frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \text{Ei}\left(\frac{4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^4}$$

```
[Out] (b*x+a)^4*Ei(4*ln(e*((b*x+a)/(d*x+c))^n)/n)/(-a*d+b*c)/n/((e*((b*x+a)/(d*x+
c))^n)^(4/n))/(d*x+c)^4
```

Rubi [A]
time = 0.07, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.086$, Rules used = {2561, 2347, 2209}

$$\frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \text{Ei}\left(\frac{4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^4(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^3/((c + d*x)^5*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^4*ExpIntegralEi[(4*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(4/n)*(c + d*x)^4)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
```

```
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(a+bx)^3}{(c+dx)^5 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx = \frac{(a+bx)^4\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n}\operatorname{Ei}\left(\frac{4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^4}$$

Mathematica [A]
time = 0.02, size = 75, normalized size = 1.00

$$\frac{(a+bx)^4\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n}\operatorname{Ei}\left(\frac{4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^3/((c + d*x)^5*Log[e*((a + b*x)/(c + d*x))^n]),x]
[Out] ((a + b*x)^4*ExpIntegralEi[(4*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(4/n)*(c + d*x)^4)
```

Maple [F]
time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{(bx+a)^3}{(dx+c)^5 \ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^3/(d*x+c)^5/ln(e*((b*x+a)/(d*x+c))^n),x)
[Out] int((b*x+a)^3/(d*x+c)^5/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3/(d*x+c)^5/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxi
ma")
[Out] integrate((b*x + a)^3/((d*x + c)^5*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Fricas [A]
time = 0.35, size = 106, normalized size = 1.41

$$\frac{e^{\left(-\frac{4}{n}\right)} \operatorname{log\_integral}\left(\frac{\left(b^{4} x^{4}+4 a b^{3} x^{3}+6 a^{2} b^{2} x^{2}+4 a^{3} b x+a^{4}\right) e^{\frac{4}{n}}}{d^{4} x^{4}+4 c d^{3} x^{3}+6 c^{2} d^{2} x^{2}+4 c^{3} d x+c^{4}}\right)}{(b c-a d) n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3/(d*x+c)^5/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fric
as")
```

```
[Out] e^(-4/n)*log_integral((b^4*x^4 + 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x +
a^4)*e^(4/n)/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4))/((b
*c - a*d)*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**3/(d*x+c)**5/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3/(d*x+c)^5/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^3/((d*x + c)^5*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,x)^3}{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,{(c+d\,x)}^5} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*x)^3/(log(e*((a + b*x)/(c + d*x))^n)*(c + d*x)^5),x)
```

```
[Out] int((a + b*x)^3/(log(e*((a + b*x)/(c + d*x))^n)*(c + d*x)^5), x)
```

3.242 $\int \frac{(a+bx)^2}{(c+dx)^4 \log \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$

Optimal. Leaf size=75

$$\frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \text{Ei}\left(\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^3}$$

```
[Out] (b*x+a)^3*Ei(3*ln(e*((b*x+a)/(d*x+c))^n)/n)/(-a*d+b*c)/n/((e*((b*x+a)/(d*x+
c))^n)^(3/n))/(d*x+c)^3
```

Rubi [A]
time = 0.07, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.086$, Rules used = {2561, 2347, 2209}

$$\frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \text{Ei}\left(\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^2/((c + d*x)^4*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^3*ExpIntegralEi[(3*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
```

```
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(a+bx)^2}{(c+dx)^4 \log \left(e \left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx = \frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \text{Ei}\left(\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^3}$$

Mathematica [A]
time = 0.02, size = 75, normalized size = 1.00

$$\frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \text{Ei}\left(\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2/((c + d*x)^4*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^3*ExpIntegralEi[(3*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3)
```

Maple [F]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(bx+a)^2}{(dx+c)^4 \ln \left(e \left(\frac{bx+a}{dx+c}\right)^n\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2/(d*x+c)^4/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int((b*x+a)^2/(d*x+c)^4/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2/(d*x+c)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxi
ma")
```

```
[Out] integrate((b*x + a)^2/((d*x + c)^4*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Fricas [A]
time = 0.36, size = 84, normalized size = 1.12

$$\frac{e^{\left(-\frac{3}{n}\right)} \operatorname{log\_integral}\left(\frac{\left(b^{3} x^{3}+3 a b^{2} x^{2}+3 a^{2} b x+a^{3}\right) e^{\frac{3}{n}}}{d^{3} x^{3}+3 c d^{2} x^{2}+3 c^{2} d x+c^{3}}\right)}{(b c-a d) n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2/(d*x+c)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fric
as")
```

```
[Out] e^(-3/n)*log_integral((b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*e^(3/n)/(d^
3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/((b*c - a*d)*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2/(d*x+c)**4/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2/(d*x+c)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^2/((d*x + c)^4*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,x)^2}{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,{(c+d\,x)}^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*x)^2/(log(e*((a + b*x)/(c + d*x))^n)*(c + d*x)^4),x)
```

```
[Out] int((a + b*x)^2/(log(e*((a + b*x)/(c + d*x))^n)*(c + d*x)^4), x)
```

3.243 $\int \frac{a+bx}{(c+dx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx$

Optimal. Leaf size=75

$$\frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \text{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^2}$$

```
[Out] (b*x+a)^2*Ei(2*ln(e*((b*x+a)/(d*x+c))^n)/n)/(-a*d+b*c)/n/((e*((b*x+a)/(d*x+
c))^n)^(2/n))/(d*x+c)^2
```

Rubi [A]
time = 0.05, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2561, 2347, 2209}

$$\frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \text{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)/((c + d*x)^3*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^2*ExpIntegralEi[(2*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
```

```
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{a+bx}{(c+dx)^3 \log \left(e \left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx = \frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \operatorname{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^2}$$

Mathematica [A]
time = 0.02, size = 75, normalized size = 1.00

$$\frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \operatorname{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)/((c + d*x)^3*Log[e*((a + b*x)/(c + d*x))^n]),x]
[Out] ((a + b*x)^2*ExpIntegralEi[(2*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2)
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{bx+a}{(dx+c)^3 \ln \left(e \left(\frac{bx+a}{dx+c}\right)^n\right)} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)/(d*x+c)^3/ln(e*((b*x+a)/(d*x+c))^n),x)
[Out] int((b*x+a)/(d*x+c)^3/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima
")
[Out] integrate((b*x + a)/((d*x + c)^3*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Fricas [**A**]
time = 0.38, size = 62, normalized size = 0.83

$$\frac{e^{\left(-\frac{2}{n}\right)}\operatorname{log\_integral}\left(\frac{(b^2x^2+2\,abx+a^2)e^{\frac{2}{n}}}{d^2x^2+2\,cdx+c^2}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas
")
```

```
[Out] e^(-2/n)*log_integral((b^2*x^2 + 2*a*b*x + a^2)*e^(2/n)/(d^2*x^2 + 2*c*d*x
+ c^2))/((b*c - a*d)*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)**3/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)/((d*x + c)^3*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,x}{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,{\left(c+d\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*x)/(log(e*((a + b*x)/(c + d*x))^n)*(c + d*x)^3),x)
```

```
[Out] int((a + b*x)/(log(e*((a + b*x)/(c + d*x))^n)*(c + d*x)^3), x)
```

3.244 $\int \frac{1}{(c+dx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx$

Optimal. Leaf size=72

$$\frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \operatorname{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)}$$

```
[Out] (b*x+a)*Ei(ln(e*((b*x+a)/(d*x+c))^n)/n)/(-a*d+b*c)/n/((e*((b*x+a)/(d*x+c))^
n)^(1/n))/(d*x+c)
```

Rubi [A]

time = 0.04, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.107$, Rules used = {2551, 2337, 2209}

$$\frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \operatorname{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + d*x)^2*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)*ExpIntegralEi[Log[e*((a + b*x)/(c + d*x))^n]/n])/((b*c - a*d)*n*
(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x))
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] && !TrueQ[$UseGamma]
```

Rule 2337

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_), x_Symbol] :> Dist[x/(n*(c*x
^n)^(1/n)), Subst[Int[E^(x/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[
{a, b, c, n, p}, x]
```

Rule 2551

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(m +
1)*(g/d)^m, Subst[Int[(A + B*Log[e*x^n])^p/(b - d*x)^(m + 2), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ[b*c -
 a*d, 0] && IntegersQ[m, p] && EqQ[d*f - c*g, 0] && (GtQ[p, 0] || LtQ[m, -1
```

```
])
```

Rubi steps

$$\int \frac{1}{(c+dx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx = \frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\text{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)}$$

Mathematica [A]
time = 0.05, size = 72, normalized size = 1.00

$$\frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\text{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + d*x)^2*Log[e*((a + b*x)/(c + d*x))^n]),x]
[Out] ((a + b*x)*ExpIntegralEi[Log[e*((a + b*x)/(c + d*x))^n]/n])/((b*c - a*d)*n*
(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x))
```

Maple [F]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dx+c\right)^2 \ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*x+c)^2/ln(e*((b*x+a)/(d*x+c))^n),x)
[Out] int(1/(d*x+c)^2/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima")
[Out] integrate(1/((d*x + c)^2*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Fricas [**A**]
time = 0.35, size = 38, normalized size = 0.53

$$\frac{e^{\left(-\frac{1}{n}\right)} \operatorname{log\_integral}\left(\frac{(bx+a)e^{\frac{1}{n}}}{dx+c}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas")
[Out] e^(-1/n)*log_integral((b*x + a)*e^(1/n)/(d*x + c))/((b*c - a*d)*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)**2/ln(e*((b*x+a)/(d*x+c))**n),x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
[Out] integrate(1/((d*x + c)^2*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,{\left(c+d\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(log(e*((a + b*x)/(c + d*x))^n)*(c + d*x)^2),x)
[Out] int(1/(log(e*((a + b*x)/(c + d*x))^n)*(c + d*x)^2), x)
```

3.245 $\int \frac{1}{(a+bx)(c+dx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=33

$$\frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)n}$$

```
[Out] ln(ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)/n
```

Rubi [A]
time = 0.06, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.086$, Rules used = {2561, 2339, 29}

$$\frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{n(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)*(c + d*x)*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Log[Log[e*((a + b*x)/(c + d*x))^n]]/((b*c - a*d)*n)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx = \frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)n}$$

Mathematica [A]
time = 0.03, size = 34, normalized size = 1.03

$$-\frac{\log \left(\log \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(-bc+ad)n}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*Log[e*((a + b*x)/(c + d*x))^n]),x]
[Out] -(Log[Log[e*((a + b*x)/(c + d*x))^n]]/((-(b*c) + a*d)*n))
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{1}{(bx+a)(dx+c)\ln \left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/ln(e*((b*x+a)/(d*x+c))^n),x)
[Out] int(1/(b*x+a)/(d*x+c)/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [A]
time = 0.44, size = 34, normalized size = 1.03

$$\frac{\log \left(-\log \left((bx+a)^n\right)+\log \left((dx+c)^n\right)-1\right)}{bcn-adn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima
")
[Out] log(-log((b*x + a)^n) + log((d*x + c)^n) - 1)/(b*c*n - a*d*n)
```

Fricas [A]
time = 0.41, size = 33, normalized size = 1.00

$$\frac{\log \left(n\log \left(\frac{bx+a}{dx+c}\right)+1\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas
")
[Out] log(n*log((b*x + a)/(d*x + c)) + 1)/((b*c - a*d)*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 82 vs. 2(34) = 68.
time = 4.15, size = 82, normalized size = 2.48

$$\frac{\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)\log\left(\frac{1}{4}\pi^2(\operatorname{sgn}(bx+a)\operatorname{sgn}(dx+c)-1)^2n^2+\left(n\log\left(\frac{|bx+a|}{|dx+c|}\right)+1\right)^2\right)}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] 1/2*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)*log(1/4*pi^2*(sgn(b*x + a)*sgn(
d*x + c) - 1)^2*n^2 + (n*log(abs(b*x + a)/abs(d*x + c)) + 1)^2)/n
```

Mupad [**B**]
time = 4.48, size = 33, normalized size = 1.00

$$-\frac{\ln\left(\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)}{a\,d\,n-b\,c\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(log(e*((a + b*x)/(c + d*x))^n)*(a + b*x)*(c + d*x)),x)
```

```
[Out] -log(log(e*((a + b*x)/(c + d*x))^n))/(a*d*n - b*c*n)
```

3.246 $\int \frac{1}{(a+bx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$

Optimal. Leaf size=71

$$\frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}(c+dx)\text{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)}$$

```
[Out] (e*((b*x+a)/(d*x+c))^n)^(1/n)*(d*x+c)*Ei(-ln(e*((b*x+a)/(d*x+c))^n)/n)/(-a*
d+b*c)/n/(b*x+a)
```

Rubi [A]

time = 0.04, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.107$, Rules used = {2549, 2347, 2209}

$$\frac{(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)^2*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x)*ExpIntegralEi[-(Log[e*((a + b
*x)/(c + d*x))^n]/n)])/((b*c - a*d)*n*(a + b*x))
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2549

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.), x_Symbol] :> Dist[(b*c - a*d)^(m +
1)*(g/b)^m, Subst[Int[x^m*((A + B*Log[e*x^n])^p/(b - d*x)^(m + 2)), x], x,
(a + b*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, n}, x] && NeQ
[b*c - a*d, 0] && IntegersQ[m, p] && EqQ[b*f - a*g, 0] && (GtQ[p, 0] || LtQ
```

```
[m, -1])
```

Rubi steps

$$\int \frac{1}{(a+bx)^2 \log \left(e \left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx = \frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}} (c+dx)\text{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)}$$

Mathematica [A]
time = 0.05, size = 71, normalized size = 1.00

$$\frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}} (c+dx)\text{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)^2*Log[e*((a + b*x)/(c + d*x))^n]),x]
[Out] ((e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x)*ExpIntegralEi[-(Log[e*((a + b
*x)/(c + d*x))^n]/n)])/((b*c - a*d)*n*(a + b*x))
```

Maple [F]
time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bx+a\right)^{2} \ln \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)^2/ln(e*((b*x+a)/(d*x+c))^n),x)
[Out] int(1/(b*x+a)^2/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima")
[Out] integrate(1/((b*x + a)^2*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Fricas [**A**]
time = 0.36, size = 38, normalized size = 0.54

$$\frac{e^{\frac{1}{n}} \operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{1}{n}\right)}}{bx+a}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas")
[Out] e^(1/n)*log_integral((d*x + c)*e^(-1/n)/(b*x + a))/((b*c - a*d)*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)**2/ln(e*((b*x+a)/(d*x+c))**n),x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
[Out] integrate(1/((b*x + a)^2*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,{\left(a+b\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(log(e*((a + b*x)/(c + d*x))^n)*(a + b*x)^2),x)
[Out] int(1/(log(e*((a + b*x)/(c + d*x))^n)*(a + b*x)^2), x)
```

3.247 $\int \frac{c+dx}{(a+bx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx$

Optimal. Leaf size=75

$$\frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} (c+dx)^2 \text{Ei}\left(-\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)^2}$$

```
[Out] (e*((b*x+a)/(d*x+c))^n)^(2/n)*(d*x+c)^2*Ei(-2*ln(e*((b*x+a)/(d*x+c))^n)/n)/
(-a*d+b*c)/n/(b*x+a)^2
```

Rubi [A]
time = 0.06, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2561, 2347, 2209}

$$\frac{(c+dx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} \text{Ei}\left(-\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x)/((a + b*x)^3*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2*ExpIntegralEi[(-2*Log[e*((a
+ b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^2)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
```

```
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{c+dx}{(a+bx)^3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx=\frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n}(c+dx)^2\text{Ei}\left(-\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)^2}$$

Mathematica [A]
time = 0.01, size = 75, normalized size = 1.00

$$\frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n}(c+dx)^2\text{Ei}\left(-\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x)/((a + b*x)^3*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2*ExpIntegralEi[(-2*Log[e*((a
+ b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^2)
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{dx+c}{(bx+a)^3\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x+c)/(b*x+a)^3/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int((d*x+c)/(b*x+a)^3/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(b*x+a)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima
")
```

```
[Out] integrate((d*x + c)/((b*x + a)^3*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Fricas [A]
time = 0.40, size = 62, normalized size = 0.83

$$\frac{e^{\frac{2}{n}} \log\_integral\left(\frac{(d^2x^2+2\,cdx+c^2)e^{\left(-\frac{2}{n}\right)}}{b^2x^2+2\,abx+a^2}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(b*x+a)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas
")
[Out] e^(2/n)*log_integral((d^2*x^2 + 2*c*d*x + c^2)*e^(-2/n)/(b^2*x^2 + 2*a*b*x
+ a^2))/((b*c - a*d)*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(b*x+a)**3/ln(e*((b*x+a)/(d*x+c))**n),x)
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(b*x+a)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
[Out] integrate((d*x + c)/((b*x + a)^3*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{c+d\,x}{\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\,{\left(a+b\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + d*x)/(log(e*((a + b*x)/(c + d*x))^n)*(a + b*x)^3),x)
[Out] int((c + d*x)/(log(e*((a + b*x)/(c + d*x))^n)*(a + b*x)^3), x)
```

3.248 $\int \frac{(c+dx)^2}{(a+bx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$

Optimal. Leaf size=75

$$\frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} (c+dx)^3 \text{Ei}\left(-\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)^3}$$

```
[Out] (e*((b*x+a)/(d*x+c))^n)^(3/n)*(d*x+c)^3*Ei(-3*ln(e*((b*x+a)/(d*x+c))^n)/n)/
(-a*d+b*c)/n/(b*x+a)^3
```

Rubi [A]
time = 0.07, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.086$, Rules used = {2561, 2347, 2209}

$$\frac{(c+dx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} \text{Ei}\left(-\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x)^2/((a + b*x)^4*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3*ExpIntegralEi[(-3*Log[e*((a
 + b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^3)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2347

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)/n)
*x)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2561

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(m + q + 1)*(g/b)^m*(i/d)^q, Subst[Int[x^m*((A + B*Lo
g[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x)], x] /; Free
Q[{a, b, c, d, e, f, g, h, i, A, B, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[b
```

```
*f - a*g, 0] && EqQ[d*h - c*i, 0] && IntegersQ[m, q]
```

Rubi steps

$$\int \frac{(c+dx)^2}{(a+bx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx=\frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n}(c+dx)^3\text{Ei}\left(-\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)^3}$$

Mathematica [**A**]
time = 0.01, size = 75, normalized size = 1.00

$$\frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n}(c+dx)^3\text{Ei}\left(-\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x)^2/((a + b*x)^4*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3*ExpIntegralEi[(-3*Log[e*((a
+ b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^3)
```

Maple [**F**]
time = 0.24, size = 0, normalized size = 0.00

$$\int \frac{(dx+c)^2}{(bx+a)^4 \ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x+c)^2/(b*x+a)^4/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int((d*x+c)^2/(b*x+a)^4/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^2/(b*x+a)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxi
ma")
```

```
[Out] integrate((d*x + c)^2/((b*x + a)^4*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Fricas [A]
time = 0.38, size = 84, normalized size = 1.12

$$\frac{e^{\frac{3}{n}}\,\mathrm{log\_integral}\left(\frac{(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3)e^{\left(-\frac{3}{n}\right)}}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^2/(b*x+a)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fric
as")
```

```
[Out] e^(3/n)*log_integral((d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*e^(-3/n)/(b^
3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/((b*c - a*d)*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)**2/(b*x+a)**4/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^2/(b*x+a)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac
")
```

```
[Out] integrate((d*x + c)^2/((b*x + a)^4*log(((b*x + a)/(d*x + c))^n*e)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(c+d\,x)^2}{\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\,(a+b\,x)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + d*x)^2/(log(e*((a + b*x)/(c + d*x))^n)*(a + b*x)^4),x)
```

```
[Out] int((c + d*x)^2/(log(e*((a + b*x)/(c + d*x))^n)*(a + b*x)^4), x)
```

3.249 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^4}{(f+gx)(ah+bhx)}\,dx$

Optimal. Leaf size=361

$$-\frac{(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right))^4\log\left(1-\frac{(bf-ag)(c+dx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{4Bn(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right))^3\operatorname{Li}_2\left(\right.}{(bf-ag)h}$$

```
[Out] -(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^4*ln(1-(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*
x+a))/(-a*g+b*f)/h+4*B*n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3*polylog(2,(-a*
g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h+12*B^2*n^2*(A+B*ln(e*(b*x+a
)^n/((d*x+c)^n)))^2*polylog(3,(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+
b*f)/h+24*B^3*n^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(4,(-a*g+b*f)*(d
*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h+24*B^4*n^4*polylog(5,(-a*g+b*f)*(d*x
+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h
```

Rubi [A]
time = 0.44, antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.163$, Rules used = {2573, 2567, 12, 2379, 2421, 2430, 6724}

$$\frac{24B^3n^3\text{PolyLog}\left(4,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h(bf-ag)}+\frac{12B^2n^2\text{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{h(bf-ag)}+\frac{4Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^3}{h(bf-ag)}+\frac{24B^4n^4\text{PolyLog}\left(5,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^4}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/((f + g*x)*(a*h + b*h*x)),x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (4*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])^3*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a +
 b*x))])/((b*f - a*g)*h) + (12*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)
^n])^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f -
 a*g)*h) + (24*B^3*n^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[4,
((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*B^4
*n^4*PolyLog[5, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a
*g)*h)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
```

```
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2430

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[PolyLog[k + 1, e*x^q]*((a + b*Log[c*x^n])^p/q)
, x] - Dist[b*n*(p/q), Int[PolyLog[k + 1, e*x^q]*((a + b*Log[c*x^n])^(p - 1
)/x), x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 2567

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[b*c - a*d, Subst[Int[(b*f - a*g - (d*f - c*g)*x)^m*(b*h - a*i - (
d*h - c*i)*x)^q*((A + B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n}, x] && NeQ
[b*c - a*d, 0] && IntegersQ[m, q] && IGtQ[p, 0]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^4}{(f+gx)(ah+bhx)}\,dx = \int \left(\frac{A^4}{h(a+bx)(f+gx)} + \frac{4A^3B\log(e(a+bx)^n(c+dx)^{-n})}{h(a+bx)(f+gx)} + \cdots\right.$$

$$= \frac{A^4\int \frac{1}{(a+bx)(f+gx)}\,dx}{h} + \frac{(4A^3B)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\,dx}{h} + \frac{(6A^2 \cdots}{\cdots}$$

$$= -\frac{4A^3B\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h} - \frac{6A^2 \cdots}{\cdots}$$

$$= \frac{A^4\log(a+bx)}{(bf-ag)h} - \frac{A^4\log(f+gx)}{(bf-ag)h} - \frac{4A^3B\log(e(a+bx)^n(c+\cdots}{(bf-\cdots}$$

$$= \frac{A^4\log(a+bx)}{(bf-ag)h} - \frac{A^4\log(f+gx)}{(bf-ag)h} - \frac{4A^3B\log(e(a+bx)^n(c+\cdots}{(bf-\cdots}$$

$$= \frac{A^4\log(a+bx)}{(bf-ag)h} - \frac{A^4\log(f+gx)}{(bf-ag)h} - \frac{4A^3B\log(e(a+bx)^n(c+\cdots}{(bf-\cdots}$$

$$= \frac{A^4\log(a+bx)}{(bf-ag)h} - \frac{A^4\log(f+gx)}{(bf-ag)h} - \frac{4A^3B\log(e(a+bx)^n(c+\cdots}{(bf-\cdots}$$

Mathematica [F]
time = 2.34, size = 0, normalized size = 0.00

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^4}{(f+gx)(ah+bhx)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/((f + g*x)*(a*h + b*h*
x)),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/((f + g*x)*(a*h + b*h*
x)), x]
```

Maple [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e(bx+a)^n\,(dx+c)^{-n}\right)\right)^4}{(gx+f)\,(bhx+ah)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x, algor
ithm="maxima")
```

```
[Out] A^4*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) + integra
te((B^4*log((b*x + a)^n)^4 + B^4*log((d*x + c)^n)^4 + 4*A^3*B + 6*A^2*B^2 +
 4*A*B^3 + B^4 + 4*(A*B^3 + B^4)*log((b*x + a)^n)^3 - 4*(B^4*log((b*x + a)^
n) + A*B^3 + B^4)*log((d*x + c)^n)^3 + 6*(A^2*B^2 + 2*A*B^3 + B^4)*log((b*x
 + a)^n)^2 + 6*(B^4*log((b*x + a)^n)^2 + A^2*B^2 + 2*A*B^3 + B^4 + 2*(A*B^3
 + B^4)*log((b*x + a)^n))*log((d*x + c)^n)^2 + 4*(A^3*B + 3*A^2*B^2 + 3*A*B
^3 + B^4)*log((b*x + a)^n) - 4*(B^4*log((b*x + a)^n)^3 + A^3*B + 3*A^2*B^2
+ 3*A*B^3 + B^4 + 3*(A*B^3 + B^4)*log((b*x + a)^n)^2 + 3*(A^2*B^2 + 2*A*B^3
 + B^4)*log((b*x + a)^n))*log((d*x + c)^n))/(b*g*h*x^2 + a*f*h + (b*f*h + a
*g*h)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x, algor
ithm="fricas")
```

```
[Out] integral((B^4*log((b*x + a)^n*e/(d*x + c)^n)^4 + 4*A*B^3*log((b*x + a)^n*e/
(d*x + c)^n)^3 + 6*A^2*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 4*A^3*B*log((
b*x + a)^n*e/(d*x + c)^n) + A^4)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**4/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^4/((b*h*x + a*h)*(g*x + f)
), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)^4}{\left(f+g\,x\right)\,\left(a\,h+b\,h\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^4/((f + g*x)*(a*h + b*h*x)),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^4/((f + g*x)*(a*h + b*h*x)), x
)
```

3.250 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(f+gx)(ah+bhx)}\,dx$

Optimal. Leaf size=282

$$-\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\log\left(1-\frac{(bf-ag)(c+dx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{3Bn\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\mathrm{Li}_2}{(bf-ag)h}$$

```
[Out] -(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3*ln(1-(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*
x+a))/(-a*g+b*f)/h+3*B*n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*polylog(2,(-a*
g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h+6*B^2*n^2*(A+B*ln(e*(b*x+a)
^n/((d*x+c)^n)))*polylog(3,(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f
)/h+6*B^3*n^3*polylog(4,(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h
```

Rubi [A]
time = 0.36, antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.163, Rules used = {2573, 2567, 12, 2379, 2421, 2430, 6724}

$$\frac{6B^2n^2\text{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h(bf-ag)}+\frac{3Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{h(bf-ag)}+\frac{6B^3n^3\text{PolyLog}\left(4,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^3}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((f + g*x)*(a*h + b*h*x)),x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (3*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])^2*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a +
 b*x))])/((b*f - a*g)*h) + (6*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*
g)*h) + (6*B^3*n^3*PolyLog[4, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x
))])/((b*f - a*g)*h)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2430

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[PolyLog[k + 1, e*x^q]*((a + b*Log[c*x^n])^p/q)
, x] - Dist[b*n*(p/q), Int[PolyLog[k + 1, e*x^q]*((a + b*Log[c*x^n])^(p - 1
)/x), x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 2567

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[b*c - a*d, Subst[Int[(b*f - a*g - (d*f - c*g)*x)^m*(b*h - a*i - (
d*h - c*i)*x)^q*((A + B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n}, x] && NeQ
[b*c - a*d, 0] && IntegersQ[m, q] && IGtQ[p, 0]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(f+gx)(ah+bhx)}\,dx = \int \left(\frac{A^3}{h(a+bx)(f+gx)} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{h(a+bx)(f+gx)} +\right.$$

$$= \frac{A^3\int\frac{1}{(a+bx)(f+gx)}\,dx}{h} + \frac{(3A^2B)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\,dx}{h} + \frac{(3A}{}$$

$$= -\frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h} - \frac{3A}{}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+}{(bf}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+}{(bf}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+}{(bf}$$

Mathematica [F]
time = 1.31, size = 0, normalized size = 0.00

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(f+gx)(ah+bhx)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((f + g*x)*(a*h + b*h*
x)),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((f + g*x)*(a*h + b*h*
x)), x]
```

Maple [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e(bx+a)^n\,(dx+c)^{-n}\right)\right)^3}{(gx+f)\,(bhx+ah)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x, algor
ithm="maxima")
```

```
[Out] A^3*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) - integra
te(-(B^3*log((b*x + a)^n)^3 - B^3*log((d*x + c)^n)^3 + 3*A^2*B + 3*A*B^2 +
B^3 + 3*(A*B^2 + B^3)*log((b*x + a)^n)^2 + 3*(B^3*log((b*x + a)^n) + A*B^2
+ B^3)*log((d*x + c)^n)^2 + 3*(A^2*B + 2*A*B^2 + B^3)*log((b*x + a)^n) - 3*
(B^3*log((b*x + a)^n)^2 + A^2*B + 2*A*B^2 + B^3 + 2*(A*B^2 + B^3)*log((b*x
+ a)^n))*log((d*x + c)^n))/(b*g*h*x^2 + a*f*h + (b*f*h + a*g*h)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x, algor
ithm="fricas")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(b*g*h*x^2 +
 a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/((b*h*x + a*h)*(g*x + f)
), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^3}{\left(f+g\,x\right)\,\left(a\,h+b\,h\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/((f + g*x)*(a*h + b*h*x)),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/((f + g*x)*(a*h + b*h*x)), x
)
```

3.251 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(f+gx)(ah+bhx)}\,dx$

Optimal. Leaf size=203

$$-\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\log\left(1-\frac{(bf-ag)(c+dx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{2Bn\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\mathrm{Li}_2\left(\right.}{(bf-ag)h}$$

```
[Out] -(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*ln(1-(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*
x+a))/(-a*g+b*f)/h+2*B*n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(2,(-a*g+
b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h+2*B^2*n^2*polylog(3,(-a*g+b*f
)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h
```

Rubi [A]
time = 0.30, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.140$, Rules used = {2573, 2567, 12, 2379, 2421, 6724}

$$\frac{2Bn\,\mathrm{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h(bf-ag)}+\frac{2B^2n^2\,\mathrm{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/((f + g*x)*(a*h + b*h*x)),x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (2*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b
*x))])/((b*f - a*g)*h) + (2*B^2*n^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*
f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
```

```
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2567

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[b*c - a*d, Subst[Int[(b*f - a*g - (d*f - c*g)*x)^m*(b*h - a*i - (
d*h - c*i)*x)^q*((A + B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n}, x] && NeQ
[b*c - a*d, 0] && IntegersQ[m, q] && IGtQ[p, 0]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(f+gx)(ah+bhx)}\,dx = \int \left(\frac{A^2}{h(a+bx)(f+gx)}+\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{h(a+bx)(f+gx)}+\right.$$

$$= \frac{A^2\int\frac{1}{(a+bx)(f+gx)}\,dx}{h}+\frac{(2AB)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\,dx}{h}+\frac{B^2\int}{}$$

$$= -\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}-\frac{B^2}{}$$

$$= \frac{A^2\log(a+bx)}{(bf-ag)h}-\frac{A^2\log(f+gx)}{(bf-ag)h}-\frac{2AB\log(e(a+bx)^n(c+}{(bf-}$$

$$= \frac{A^2\log(a+bx)}{(bf-ag)h}-\frac{A^2\log(f+gx)}{(bf-ag)h}-\frac{2AB\log(e(a+bx)^n(c+}{(bf-}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1415 vs. $2(203) = 406$.

time = 0.49, size = 1415, normalized size = 6.97

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/((f + g*x)*(a*h + b*h*
x)),x]
```

```
[Out] (3*Log[a + b*x]*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*
x)^n)/(c + d*x)^n]))^2 - 3*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log
[(e*(a + b*x)^n)/(c + d*x)^n]))^2*Log[f + g*x] + 3*B*n*(A + B*(-(n*Log[a +
b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n]))*(Log[a + b*x]^2
 - 2*(Log[a + b*x]*Log[(b*(f + g*x))/(b*f - a*g)] + PolyLog[2, (g*(a + b*x)
)/(-(b*f) + a*g)])) - 6*A*B*n*(Log[c + d*x]*(Log[(d*(a + b*x))/(-(b*c) + a*
d)] - Log[(d*(f + g*x))/(d*f - c*g)]) + PolyLog[2, (b*(c + d*x))/(b*c - a*d
)] - PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)]) + 6*B^2*n*(n*Log[a + b*x] -
n*Log[c + d*x] - Log[(e*(a + b*x)^n)/(c + d*x)^n])*(Log[c + d*x]*(Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[(d*(f + g*x))/(d*f - c*g)]) + PolyLog[2, (b*
(c + d*x))/(b*c - a*d)] - PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)]) + B^2*n
^2*(Log[a + b*x]^2*(Log[a + b*x] - 3*Log[(b*(f + g*x))/(b*f - a*g)]) - 6*Lo
g[a + b*x]*PolyLog[2, (g*(a + b*x))/(-(b*f) + a*g)] + 6*PolyLog[3, (g*(a +
b*x))/(-(b*f) + a*g)]) + 3*B^2*n^2*(Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c
 + d*x]^2 - Log[c + d*x]^2*Log[(d*(f + g*x))/(d*f - c*g)] + 2*Log[c + d*x]*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*Log[c + d*x]*PolyLog[2, (g*(c + d
*x))/(-(d*f) + c*g)] - 2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[
3, (g*(c + d*x))/(-(d*f) + c*g)]) - 6*B^2*n^2*((Log[a + b*x]^2*(Log[c + d*x
] - Log[(b*(c + d*x))/(b*c - a*d)]))/2 - Log[a + b*x]*Log[c + d*x]*Log[(b*(
f + g*x))/(b*f - a*g)] - (Log[(g*(c + d*x))/(-(d*f) + c*g)]*(-2*Log[a + b*x
] + Log[(g*(c + d*x))/(-(d*f) + c*g)])*(Log[(b*(f + g*x))/(b*f - a*g)] - Lo
g[(d*(f + g*x))/(d*f - c*g)]))/2 + Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[((
b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]*(Log[(b*(f + g*x))/(b*f - a*
g)] - Log[(d*(f + g*x))/(d*f - c*g)]) - (Log[((b*f - a*g)*(c + d*x))/((d*f
- c*g)*(a + b*x))]^2*(Log[(-(b*c) + a*d)/(d*(a + b*x))] + Log[(b*(f + g*x))
/(b*f - a*g)] - Log[((-(b*c) + a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))]))/2
 - Log[a + b*x]*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - (Log[c + d*x] -
Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])*PolyLog[2, (g*(a + b*
x))/(-(b*f) + a*g)] - (Log[a + b*x] + Log[((b*f - a*g)*(c + d*x))/((d*f - c
*g)*(a + b*x))])*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)] - Log[((b*f - a*g
)*(c + d*x))/((d*f - c*g)*(a + b*x))]*(PolyLog[2, (b*(c + d*x))/(d*(a + b*x
))] - PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]) + PolyLo
g[3, (d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[3, (g*(a + b*x))/(-(b*f) + a*g
)] + PolyLog[3, (g*(c + d*x))/(-(d*f) + c*g)] + PolyLog[3, (b*(c + d*x))/(d
*(a + b*x))] - PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])
)/(3*(b*f - a*g)*h)
```

Maple [F]
time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e(bx+a)^{n}\left(dx+c\right)^{-n}\right)\right)^{2}}{\left(gx+f\right)\left(bhx+ah\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x)
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x, algor
ithm="maxima")
[Out] A^2*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) + integra
te((B^2*log((b*x + a)^n)^2 + B^2*log((d*x + c)^n)^2 + 2*A*B + B^2 + 2*(A*B
+ B^2)*log((b*x + a)^n) - 2*(B^2*log((b*x + a)^n) + A*B + B^2)*log((d*x + c
)^n))/(b*g*h*x^2 + a*f*h + (b*f*h + a*g*h)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x, algor
ithm="fricas")
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(g*x+f)/(b*h*x+a*h),x)
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/((b*h*x + a*h)*(g*x + f)
), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)^2}{\left(f+g\,x\right)\,\left(a\,h+b\,h\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/((f + g*x)*(a*h + b*h*x)),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/((f + g*x)*(a*h + b*h*x)), x
)
```

3.252 $\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(f+gx)(ah+bhx)}\,dx$

Optimal. Leaf size=123

$$-\frac{(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right))\log\left(1-\frac{(bf-ag)(c+dx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{Bn\text{Li}_2\left(\frac{(bf-ag)(c+dx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}$$

```
[Out] -(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*ln(1-(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+
a))/(-a*g+b*f)/h+B*n*polylog(2,(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g
+b*f)/h
```

Rubi [A]
time = 0.18, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}} = 0.122$, Rules used = {2573, 2567, 12, 2379, 2438}

$$\frac{Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((f + g*x)*(a*h + b*h*x)),x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*Log[1 - ((b*f - a*g)*(c + d*x))
/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (B*n*PolyLog[2, ((b*f - a*g)*
(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2567

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[b*c - a*d, Subst[Int[(b*f - a*g - (d*f - c*g)*x)^m*(b*h - a*i - (
d*h - c*i)*x)^q*((A + B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b
*x)/(c + d*x)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n}, x] && NeQ
[b*c - a*d, 0] && IntegersQ[m, q] && IGtQ[p, 0]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(f+gx)(ah+bhx)}\,dx &= \int \left(\frac{A}{h(a+bx)(f+gx)}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h(a+bx)(f+gx)}\right)dx\\
&= \frac{A\int \frac{1}{(a+bx)(f+gx)}\,dx}{h}+\frac{B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(f+gx)}\,dx}{h}\\
&= -\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{(Ab)\int \frac{1}{a+bx}}{(bf-ag)}\\
&= \frac{A\log(a+bx)}{(bf-ag)h}-\frac{A\log(f+gx)}{(bf-ag)h}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\text{lo}}{(bf-ag)h}\\
&= \frac{A\log(a+bx)}{(bf-ag)h}-\frac{A\log(f+gx)}{(bf-ag)h}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\text{lo}}{(bf-ag)h}
\end{aligned}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 304 vs. 2(123) = 246.
time = 0.10, size = 304, normalized size = 2.47

$$-\frac{-2A\log(a+bx)+Bn\log^2(a+bx)-2Bn\log(a+bx)\log(c+dx)+2Bn\log\left(\frac{d(a+bx)}{-bc+ad}\right)\log(c+dx)-2B\log(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+2A\log(f+gx)-2Bn\log(a+bx)\log(f+gx)+2Bn\log(c+dx)\log(f+gx)+2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log(f+gx)+2Bn\log(a+bx)\log\left(\frac{b(f+gx)}{bf-ag}\right)-2Bn\log(c+dx)\log\left(\frac{d(f+gx)}{df-cg}\right)+2Bn\text{Li}_2\left(\frac{g(a+bx)}{-bf+ag}\right)+2Bn\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)-2Bn\text{Li}_2\left(\frac{g(c+dx)}{-df+cg}\right)}{2(bf-ag)h}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((f + g*x)*(a*h + b*h*x)
),x]
```

```
[Out] -1/2*(-2*A*Log[a + b*x] + B*n*Log[a + b*x]^2 - 2*B*n*Log[a + b*x]*Log[c + d
*x] + 2*B*n*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] - 2*B*Log[a + b*
```

x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*A*Log[f + g*x] - 2*B*n*Log[a + b*x]
*Log[f + g*x] + 2*B*n*Log[c + d*x]*Log[f + g*x] + 2*B*Log[(e*(a + b*x)^n)/(
c + d*x)^n]*Log[f + g*x] + 2*B*n*Log[a + b*x]*Log[(b*(f + g*x))/(b*f - a*g)
] - 2*B*n*Log[c + d*x]*Log[(d*(f + g*x))/(d*f - c*g)] + 2*B*n*PolyLog[2, (g
*(a + b*x))/(-(b*f) + a*g)] + 2*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] -
 2*B*n*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)])/((b*f - a*g)*h)

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.43, size = 1447, normalized size = 11.76

method	result	size
risch	Expression too large to display	1447

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x,method=_RETURNV
ERBOSE)

[Out] 1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn
(I*(b*x+a)^n/((d*x+c)^n))-1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e)*csgn(I
*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I/h/(a*g-b*f)*l
n(b*x+a)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(
a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2
+1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((
d*x+c)^n)*(b*x+a)^n)^2-1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*c
sgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*e)*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e)
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/h*B*n/(a*g-b*f)*dilog((d*(g*x+f)+c*g-d
*f)/(c*g-d*f))-1/h*B*n/(a*g-b*f)*dilog((-a*d+c*b+(b*x+a)*d)/(-a*d+b*c))+1/h
/(a*g-b*f)*ln(g*x+f)*B*ln(e)-1/h/(a*g-b*f)*ln(b*x+a)*B*ln(e)+1/2*I/h/(a*g-b
*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I/
h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^
n)*(b*x+a)^n)^2+1/h*A/(a*g-b*f)*ln(g*x+f)-1/h*A/(a*g-b*f)*ln(b*x+a)-1/2*I/h
/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I/h/(a*g-b*
f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/h*B*n/(a*g-b*f)*dilog((
b*(g*x+f)+a*g-b*f)/(a*g-b*f))+1/2/h*B*n/(a*g-b*f)*ln(b*x+a)^2-1/h*B*ln((d*x
+c)^n)/(a*g-b*f)*ln(g*x+f)-1/h*B*ln((b*x+a)^n)/(a*g-b*f)*ln(b*x+a)+1/2*I/h/
(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)+1/h*B*ln((d*x+c)^n)/(a*g-b*f)*ln(b*x+a)-1/2*I/h/(a*g-
b*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/
((d*x+c)^n))+1/h*B/(a*g-b*f)*ln(g*x+f)*ln((b*x+a)^n)+1/2*I/h/(a*g-b*f)*ln(b
*x+a)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*
Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/h*B*n/(a*g-b*f)*ln(g*x+f)*ln((d*(g*x+f
)+c*g-d*f)/(c*g-d*f))-1/h*B*n/(a*g-b*f)*ln(b*x+a)*ln((-a*d+c*b+(b*x+a)*d)/(
-a*d+b*c))-1/h*B*n/(a*g-b*f)*ln(g*x+f)*ln((b*(g*x+f)+a*g-b*f)/(a*g-b*f))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x, algorit
hm="maxima")
```

```
[Out] A*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) - B*integra
te(-(log((b*x + a)^n) - log((d*x + c)^n) + 1)/(b*g*h*x^2 + a*f*h + (b*f*h +
 a*g*h)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x, algorit
hm="fricas")
```

```
[Out] integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*g*h*x^2 + a*f*h + (b*f +
 a*g)*h*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x, algorit
hm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/((b*h*x + a*h)*(g*x + f)),
 x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A+B\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)}{(f+g\,x)\,(a\,h+b\,h\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/((f + g*x)*(a*h + b*h*x)),x)
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/((f + g*x)*(a*h + b*h*x)), x)
```

3.253 $\int \frac{1}{(f+gx)(ah+bhx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=82

$$\text{Subst}\left(\text{Int}\left(\frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)},x\right),e\left(\frac{a+bx}{c+dx}\right)^n,e(a+bx)^n(c+dx)^{-n}\right)$$

```
[Out] _eval(Unintegrable(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
,e*((b*x+a)/(d*x+c))^n = e*(b*x+a)^n/((d*x+c)^n))
```

Rubi [A]
time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Defer[Subst][Defer[Int][1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])), x], e*((a + b*x)/(c + d*x))^n, (e*(a + b*x)^n)/(c + d*x)^n
]
```

Rubi steps

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx = \int \left(\frac{b}{(bf-ag)h(a+bx)\left(A+B\log(e(a+b\right.}\right.$$

$$= \frac{b\int \frac{1}{(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx}{(bf-ag)h} - \frac{g\int \frac{}{(}}{}$$

Mathematica [A]
time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])),x]
```

```
[Out] Integrate[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])), x]
```

Maple [**A**]
time = 0.22, size = 0, normalized size = 0.00

$$\int \frac{1}{(gx+f)\,(bhx+ah)\,\big(A+B\ln\big(e\,(bx+a)^{n}\,(dx+c)^{-n}\big)\big)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] int(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algor
ithm="maxima")
```

```
[Out] integrate(1/((b*h*x + a*h)*(g*x + f)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)
), x)
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algor
ithm="fricas")
```

```
[Out] integral(1/(A*b*g*h*x^2 + A*a*f*h + (A*b*f + A*a*g)*h*x + (B*b*g*h*x^2 + B*
a*f*h + (B*b*f + B*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algor
ithm="giac")
```

```
[Out] integrate(1/((b*h*x + a*h)*(g*x + f)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)
), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{(f+g\,x)\,(a\,h+b\,h\,x)\,\left(A+B\,\ln\left(\frac{e\,{(a+b\,x)}^n}{{(c+d\,x)}^n}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)*(a*h + b*h*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))),x)
```

```
[Out] int(1/((f + g*x)*(a*h + b*h*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))), x
)
```

3.254 $\int \frac{1}{(f+gx)(ah+bhx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}\,dx$

Optimal. Leaf size=82

$$\text{Subst}\left(\text{Int}\left(\frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2},x\right),e\left(\frac{a+bx}{c+dx}\right)^n,e(a+bx)^n(c+dx)^{-n}\right)$$

```
[Out] _eval(Unintegrable(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,
x),e*((b*x+a)/(d*x+c))^n = e*(b*x+a)^n/((d*x+c)^n))
```

Rubi [A]
time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2),
x]
```

```
[Out] Defer[Subst][Defer[Int][1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2), x], e*((a + b*x)/(c + d*x))^n, (e*(a + b*x)^n)/(c + d*x)
^n]
```

Rubi steps

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx = \int \left(\frac{b}{(bf-ag)h(a+bx)\left(A+B\log(e(a-\right.}\right.$$

$$= \frac{b\int \frac{1}{(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}\,dx}{(bf-ag)h} - \frac{g}{}$$

Mathematica [A]
time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])^2),x]
```

```
[Out] Integrate[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])^2), x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{1}{(gx+f)(bhx+ah)\left(A+B\ln\left(e\,(bx+a)^{n}\,(dx+c)^{-n}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] int(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, alg
orithm="maxima")
```

```
[Out] (d*f - c*g)*integrate(1/((b*c*f^2*h*n - a*d*f^2*h*n)*A*B + (b*c*f^2*h*n - a
*d*f^2*h*n)*B^2 + ((b*c*g^2*h*n - a*d*g^2*h*n)*A*B + (b*c*g^2*h*n - a*d*g^2
*h*n)*B^2)*x^2 + 2*((b*c*f*g*h*n - a*d*f*g*h*n)*A*B + (b*c*f*g*h*n - a*d*f*
g*h*n)*B^2)*x + ((b*c*g^2*h*n - a*d*g^2*h*n)*B^2*x^2 + 2*(b*c*f*g*h*n - a*d
*f*g*h*n)*B^2*x + (b*c*f^2*h*n - a*d*f^2*h*n)*B^2)*log((b*x + a)^n) - ((b*c
*g^2*h*n - a*d*g^2*h*n)*B^2*x^2 + 2*(b*c*f*g*h*n - a*d*f*g*h*n)*B^2*x + (b*
c*f^2*h*n - a*d*f^2*h*n)*B^2)*log((d*x + c)^n)), x) - (d*x + c)/((b*c*f*h*n
 - a*d*f*h*n)*A*B + (b*c*f*h*n - a*d*f*h*n)*B^2 + ((b*c*g*h*n - a*d*g*h*n)*
A*B + (b*c*g*h*n - a*d*g*h*n)*B^2)*x + ((b*c*g*h*n - a*d*g*h*n)*B^2*x + (b*
c*f*h*n - a*d*f*h*n)*B^2)*log((b*x + a)^n) - ((b*c*g*h*n - a*d*g*h*n)*B^2*x
 + (b*c*f*h*n - a*d*f*h*n)*B^2)*log((d*x + c)^n))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, alg
orithm="fricas")
```

```
[Out] integral(1/(A^2*b*g*h*x^2 + A^2*a*f*h + (A^2*b*f + A^2*a*g)*h*x + (B^2*b*g*
h*x^2 + B^2*a*f*h + (B^2*b*f + B^2*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)
```

```
^2 + 2*(A*B*b*g*h*x^2 + A*B*a*f*h + (A*B*b*f + A*B*a*g)*h*x)*log((b*x + a)^
n*e/(d*x + c)^n)), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, alg
orithm="giac")
```

```
[Out] integrate(1/((b*h*x + a*h)*(g*x + f)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)
^2), x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{(f+g\,x)\,\left(a\,h+b\,h\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)*(a*h + b*h*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2),
x)
```

```
[Out] int(1/((f + g*x)*(a*h + b*h*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2),
 x)
```

3.255 $\int \frac{\log\left(\frac{c+dx}{a+bx}\right)}{(a+bx)((a-c)h+(b-d)hx)}\,dx$

Optimal. Leaf size=33

$$-\frac{\text{Li}_2\left(1-\frac{c+dx}{a+bx}\right)}{(bc-ad)h}$$

```
[Out] -polylog(2,1+(-d*x-c)/(b*x+a))/(-a*d+b*c)/h
```

Rubi [A]
time = 0.07, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.050$, Rules used = {2565, 2352}

$$-\frac{\text{PolyLog}\left(2,1-\frac{c+dx}{a+bx}\right)}{h(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[Log[(c + d*x)/(a + b*x)]/((a + b*x)*((a - c)*h + (b - d)*h*x)),x]
```

```
[Out] -(PolyLog[2, 1 - (c + d*x)/(a + b*x)]/((b*c - a*d)*h))
```

Rule 2352

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[(-e^(-1))*PolyLo
g[2, 1 - c*x], x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2565

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(q + 1)*(i/d)^q, Subst[Int[(b*f - a*g - (d*f - c*g)*x
)^m*((A + B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x
)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n}, x] && NeQ[b*c - a*d,
0] && IntegersQ[m, q] && IGtQ[p, 0] && EqQ[d*h - c*i, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\log\left(\frac{c+dx}{a+bx}\right)}{(a+bx)((a-c)h+(b-d)hx)}\,dx &= -\frac{\text{Subst}\left(\int \frac{\log(x)}{1-x}\,dx, x, \frac{c+dx}{a+bx}\right)}{(bc-ad)h}\\ &= -\frac{\text{Li}_2\left(1-\frac{c+dx}{a+bx}\right)}{(bc-ad)h}\end{aligned}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 298 vs. 2(33) = 66.
time = 0.13, size = 298, normalized size = 9.03

$$\frac{-\log^2\left(\frac{-bc+ad}{d(a+bx)}\right)+2\log\left(\frac{(b-d)(a+bx)}{bc-ad}\right)\log(a-c+bx-dx)-2\log\left(\frac{-bc+ad}{d(a+bx)}\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)-2\log(a-c+bx-dx)\log\left(\frac{(b-d)(c+dx)}{bc-ad}\right)+2\log\left(\frac{-bc+ad}{d(a+bx)}\right)\log\left(\frac{c+dx}{a+bx}\right)+2\log(a-c+bx-dx)\log\left(\frac{c+dx}{a+bx}\right)+2\text{Li}_2\left(\frac{d(a+bx)}{-bc+ad}\right)+2\text{Li}_2\left(-\frac{b(a-c+bx-dx)}{bc-ad}\right)-2\text{Li}_2\left(-\frac{d(-a+c-bx+dx)}{-bc+ad}\right)}{(2bc-2ad)h}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(c + d*x)/(a + b*x)]/((a + b*x)*((a - c)*h + (b - d)*h*x)),x]
```

```
[Out] (-Log[(-(b*c) + a*d)/(d*(a + b*x))]^2 + 2*Log[((b - d)*(a + b*x))/(b*c - a*
d)]*Log[a - c + b*x - d*x] - 2*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(b*(c
+ d*x))/(b*c - a*d)] - 2*Log[a - c + b*x - d*x]*Log[((b - d)*(c + d*x))/(b*
c - a*d)] + 2*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(c + d*x)/(a + b*x)] +
2*Log[a - c + b*x - d*x]*Log[(c + d*x)/(a + b*x)] + 2*PolyLog[2, (d*(a + b*
x))/(-(b*c) + a*d)] + 2*PolyLog[2, -((b*(a - c + b*x - d*x))/(b*c - a*d))]
- 2*PolyLog[2, -((d*(-a + c - b*x + d*x))/(-(b*c) + a*d))])/((2*b*c - 2*a*d
)*h)
```

Maple [A]
time = 0.97, size = 42, normalized size = 1.27

method	result	size
derivativedivides	$\frac{\text{dilog}\left(-\frac{ad-cb}{b(bx+a)}+\frac{d}{b}\right)}{h(ad-cb)}$	42
default	$\frac{\text{dilog}\left(-\frac{ad-cb}{b(bx+a)}+\frac{d}{b}\right)}{h(ad-cb)}$	42
risch	$\frac{\text{dilog}\left(-\frac{ad-cb}{b(bx+a)}+\frac{d}{b}\right)}{h(ad-cb)}$	42

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x,method=_RETURNVERBOSE
)
```

```
[Out] dilog(-(a*d-b*c)/b/(b*x+a)+d/b)/h/(a*d-b*c)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 357 vs. 2(32) = 64.
time = 0.31, size = 357, normalized size = 10.82

$$\left(\frac{\log\left(-(b-d)x-a+c\right)}{(bc-ad)h}-\frac{\log\left(bx+a\right)}{(bc-ad)h}\right)\log\left(\frac{dx+c}{bx+a}\right)+\frac{2\log\left(-(b-d)x-a+c\right)\log\left(bx+a\right)-\log\left(bx+a\right)^2}{2\left(bch-adh\right)}+\frac{\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\text{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)}{bch-adh}-\frac{\log\left(bx+a\right)\log\left(-\frac{a(b-d)+(b^2-bd)x}{bc-ad}+1\right)+\text{Li}_2\left(\frac{a(b-d)+(b^2-bd)x}{bc-ad}\right)}{bch-adh}-\frac{\log\left(-(b-d)x-a+c\right)\log\left(\frac{ad-cd+(bd-d^2)x}{bc-ad}+1\right)+\text{Li}_2\left(-\frac{ad-cd+(bd-d^2)x}{bc-ad}\right)}{bch-adh}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x, algorithm="ma
xima")
```

```
[Out] (log(-(b - d)*x - a + c)/((b*c - a*d)*h) - log(b*x + a)/((b*c - a*d)*h))*lo
g((d*x + c)/(b*x + a)) + 1/2*(2*log(-(b - d)*x - a + c)*log(b*x + a) - log(
b*x + a)^2)/(b*c*h - a*d*h) + (log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) +
 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))/(b*c*h - a*d*h) - (log(b*x + a)*lo
g(-(a*(b - d) + (b^2 - b*d)*x)/(b*c - a*d) + 1) + dilog((a*(b - d) + (b^2 -
 b*d)*x)/(b*c - a*d)))/(b*c*h - a*d*h) - (log(-(b - d)*x - a + c)*log((a*d
- c*d + (b*d - d^2)*x)/(b*c - a*d) + 1) + dilog(-(a*d - c*d + (b*d - d^2)*x
)/(b*c - a*d)))/(b*c*h - a*d*h)
```

Fricas [**A**]
time = 0.42, size = 32, normalized size = 0.97

$$-\frac{\mathrm{Li}_2\left(-\frac{dx+c}{bx+a}+1\right)}{(bc-ad)h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x, algorithm="fr
icas")
```

```
[Out] -dilog(-(d*x + c)/(b*x + a) + 1)/((b*c - a*d)*h)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x, algorithm="gi
ac")
```

```
[Out] integrate(log((d*x + c)/(b*x + a))/(((b - d)*h*x + (a - c)*h)*(b*x + a)), x
)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\ln\left(\frac{c+d\,x}{a+b\,x}\right)}{\left(h\,\left(a-c\right)+h\,x\,\left(b-d\right)\right)\,\left(a+b\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log((c + d*x)/(a + b*x))/((h*(a - c) + h*x*(b - d))*(a + b*x)),x)
[Out] int(log((c + d*x)/(a + b*x))/((h*(a - c) + h*x*(b - d))*(a + b*x)), x)
```

3.256 $\int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=27

$$\frac{\text{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

[Out] polylog(2,g*(d*x+c)/(b*x+a))/(-a*d+b*c)

Rubi [A]

time = 0.05, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$, Rules used = {2565, 2352}

$$\frac{\text{PolyLog}\left(2,\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

Antiderivative was successfully verified.

[In] Int[Log[(a - c*g + (b - d*g)*x)/(a + b*x)]/((a + b*x)*(c + d*x)),x]

[Out] PolyLog[2, (g*(c + d*x))/(a + b*x)]/(b*c - a*d)

Rule 2352

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[(-e^(-1))*PolyLo
g[2, 1 - c*x], x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2565

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(q + 1)*(i/d)^q, Subst[Int[(b*f - a*g - (d*f - c*g)*x
)^m*((A + B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x
)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n}, x] && NeQ[b*c - a*d,
0] && IntegersQ[m, q] && IGtQ[p, 0] && EqQ[d*h - c*i, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)}\,dx &= -\frac{g\text{Subst}\left(\int \frac{\log(x)}{1-x}\,dx, x, \frac{a-cg+(b-dg)x}{a+bx}\right)}{b(a-cg)-a(b-dg)}\\ &= \frac{\text{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}\end{aligned}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 320 vs. $2(27) = 54$.
time = 0.18, size = 320, normalized size = 11.85

$$\frac{\log^2\left(\frac{(bc-ad)g}{(b-dg)(a+bx)}\right)-2\log\left(\frac{d(a+bx)}{-bc+ad}\right)\log(c+dx)+2\log(c+dx)\log\left(-\frac{d(a-cg+bx-dgx)}{bc-ad}\right)+2\log\left(\frac{(bc-ad)g}{(b-dg)(a+bx)}\right)\log\left(-\frac{b(a-cg+bx-dgx)}{(bc-ad)g}\right)-2\log\left(\frac{(bc-ad)g}{(b-dg)(a+bx)}\right)\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)-2\log(c+dx)\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)-2\text{Li}_2\left(\frac{(b-dg)(a+bx)}{(bc-ad)g}\right)-2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)+2\text{Li}_2\left(\frac{(b-dg)(c+dx)}{bc-ad}\right)}{2bc-2ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(a - c*g + (b - d*g)*x)/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] (Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]^2 - 2*Log[(d*(a + b*x))/(-(b*c)
 + a*d)]*Log[c + d*x] + 2*Log[c + d*x]*Log[-((d*(a - c*g + b*x - d*g*x))/(b
*c - a*d))] + 2*Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]*Log[-((b*(a - c*
g + b*x - d*g*x))/((b*c - a*d)*g))] - 2*Log[((b*c - a*d)*g)/((b - d*g)*(a +
 b*x))]*Log[(a - c*g + b*x - d*g*x)/(a + b*x)] - 2*Log[c + d*x]*Log[(a - c*
g + b*x - d*g*x)/(a + b*x)] - 2*PolyLog[2, ((b - d*g)*(a + b*x))/((b*c - a*
d)*g)] - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[2, ((b - d*g)*
(c + d*x))/(b*c - a*d)])/(2*b*c - 2*a*d)
```

Maple [A]
time = 0.86, size = 45, normalized size = 1.67

method	result	size
derivativedivides	$-\frac{\operatorname{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-cb)}{b(bx+a)}\right)}{ad-cb}$	45
default	$-\frac{\operatorname{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-cb)}{b(bx+a)}\right)}{ad-cb}$	45
risch	$-\frac{\operatorname{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-cb)}{b(bx+a)}\right)}{ad-cb}$	45

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x,method=_RETURNVERBOSE)
```

```
[Out] -dilog((-d*g+b)/b+g*(a*d-b*c)/b/(b*x+a))/(a*d-b*c)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 344 vs. $2(26) = 52$.
time = 0.30, size = 344, normalized size = 12.74

$$\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)\log\left(-\frac{cg+(dg-b)x-a}{bx+a}\right)+\frac{\log(bx+a)^2-2\log(bx+a)\log(dx+c)}{2(bc-ad)}-\frac{\log(bx+a)\log\left(\frac{(dg-b)a+(bdg-b^2)x}{bcg-adg}+1\right)+\text{Li}_2\left(-\frac{(dg-b)a+(bdg-b^2)x}{bcg-adg}\right)}{bc-ad}+\frac{\log(dx+c)\log\left(\frac{cdg-bc+(d^2g-bd)x}{bc-ad}+1\right)+\text{Li}_2\left(-\frac{cdg-bc+(d^2g-bd)x}{bc-ad}\right)}{bc-ad}+\frac{\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\text{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="max
ima")
```

```
[Out] (log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log(-(c*g + (d*g - b)
*x - a)/(b*x + a)) + 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c))/(b*
```

```
c - a*d) - (log(b*x + a)*log(((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g
) + 1) + dilog(-((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g)))/(b*c - a*
d) + (log(d*x + c)*log((c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d) + 1) + d
ilog(-(c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d)))/(b*c - a*d) + (log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)/(b*c - a*d)
```

Fricas [**A**]
time = 0.39, size = 38, normalized size = 1.41

$$\frac{\mathrm{Li}_2\left(\frac{cg+(dg-b)x-a}{bx+a}+1\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="fri
cas")
```

```
[Out] dilog((c*g + (d*g - b)*x - a)/(b*x + a) + 1)/(b*c - a*d)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="gia
c")
```

```
[Out] integrate(log(-(c*g + (d*g - b)*x - a)/(b*x + a))/((b*x + a)*(d*x + c)), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\ln\left(\frac{a-c\,g+x\,(b-d\,g)}{a+b\,x}\right)}{(a+b\,x)\,(c+d\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log((a - c*g + x*(b - d*g))/(a + b*x))/((a + b*x)*(c + d*x)),x)
```

```
[Out] int(log((a - c*g + x*(b - d*g))/(a + b*x))/((a + b*x)*(c + d*x)), x)
```

3.257 $\int \frac{\log\left(1-\frac{g(c+dx)}{a+bx}\right)}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=27

$$\frac{\text{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

```
[Out] polylog(2,g*(d*x+c)/(b*x+a))/(-a*d+b*c)
```

Rubi [A]
time = 0.08, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2597, 2565, 2352}

$$\frac{\text{PolyLog}\left(2,\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

Antiderivative was successfully verified.

```
[In] Int[Log[1 - (g*(c + d*x))/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] PolyLog[2, (g*(c + d*x))/(a + b*x)]/(b*c - a*d)
```

Rule 2352

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[(-e^(-1))*PolyLo
g[2, 1 - c*x], x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2565

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(q + 1)*(i/d)^q, Subst[Int[(b*f - a*g - (d*f - c*g)*x
)^m*((A + B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x
)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n}, x] && NeQ[b*c - a*d,
0] && IntegersQ[m, q] && IGtQ[p, 0] && EqQ[d*h - c*i, 0]
```

Rule 2597

```
Int[Log[(e_.)*((f_.)*((g_) + (v_.)/(w_)))^(r_.)]^(s_.)*(u_.), x_Symbol] :>
Int[u*Log[e*(f*(ExpandToSum[v + g*w, x]/ExpandToSum[w, x]))^r]^s, x] /; Fre
eQ[{e, f, g, r, s}, x] && LinearQ[w, x] && (FreeQ[v, x] || LinearQ[v, x]) &
& AlgebraicFunctionQ[u, x]
```

Rubi steps

$$\int \frac{\log\left(1-\frac{g(c+dx)}{a+bx}\right)}{(a+bx)(c+dx)}\,dx = \int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)}\,dx$$
$$= -\frac{g\text{Subst}\left(\int \frac{\log(x)}{1-x}\,dx, x, \frac{a-cg+(b-dg)x}{a+bx}\right)}{b(a-cg)-a(b-dg)}$$
$$= \frac{\text{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 320 vs. $2(27) = 54$.
time = 0.13, size = 320, normalized size = 11.85

$$\frac{\log^2\left(\frac{(bc-ad)g}{(b-dg)(a+bx)}\right)-2\log\left(\frac{d(a+bx)}{-bc+ad}\right)\log(c+dx)+2\log(c+dx)\log\left(-\frac{d(a-cg+bx-dgx)}{bc-ad}\right)+2\log\left(\frac{(bc-ad)g}{(b-dg)(a+bx)}\right)\log\left(-\frac{b(a-cg+bx-dgx)}{(bc-ad)g}\right)-2\log\left(\frac{(bc-ad)g}{(b-dg)(a+bx)}\right)\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)-2\log(c+dx)\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)-2\text{Li}_2\left(\frac{(b-dg)(a+bx)}{(bc-ad)g}\right)-2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)+2\text{Li}_2\left(\frac{(b-dg)(c+dx)}{bc-ad}\right)}{2bc-2ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[1 - (g*(c + d*x))/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] (Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]^2 - 2*Log[(d*(a + b*x))/(-(b*c)
 + a*d)]*Log[c + d*x] + 2*Log[c + d*x]*Log[-((d*(a - c*g + b*x - d*g*x))/(b
*c - a*d))] + 2*Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]*Log[-((b*(a - c*
g + b*x - d*g*x))/((b*c - a*d)*g))] - 2*Log[((b*c - a*d)*g)/((b - d*g)*(a +
 b*x))]*Log[(a - c*g + b*x - d*g*x)/(a + b*x)] - 2*Log[c + d*x]*Log[(a - c*
g + b*x - d*g*x)/(a + b*x)] - 2*PolyLog[2, ((b - d*g)*(a + b*x))/((b*c - a*
d)*g)] - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[2, ((b - d*g)*
(c + d*x))/(b*c - a*d)])/(2*b*c - 2*a*d)
```

Maple [A]
time = 0.75, size = 45, normalized size = 1.67

method	result	size
derivativedivides	$-\frac{\text{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-cb)}{b(bx+a)}\right)}{ad-cb}$	45
default	$-\frac{\text{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-cb)}{b(bx+a)}\right)}{ad-cb}$	45
risch	$-\frac{\text{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-cb)}{b(bx+a)}\right)}{ad-cb}$	45

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x,method=_RETURNVERBOSE)
```

```
[Out] -dilog((-d*g+b)/b+g*(a*d-b*c)/b/(b*x+a))/(a*d-b*c)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 336 vs. $2(26) = 52$.
time = 0.29, size = 336, normalized size = 12.44

$$\left(\frac{\log\left(bx+a\right)}{bc-ad}-\frac{\log\left(dx+c\right)}{bc-ad}\right)\log\left(-\frac{(dx+c)g}{bx+a}+1\right)+\frac{\log\left(bx+a\right)^2-2\log\left(bx+a\right)\log\left(dx+c\right)}{2\left(bc-ad\right)}-\frac{\log\left(bx+a\right)\log\left(\frac{(dg-b)a+(bdg-b^2)x}{bcg-adg}+1\right)+\mathrm{Li}_2\left(-\frac{(dg-b)a+(bdg-b^2)x}{bcg-adg}\right)}{bc-ad}+\frac{\log\left(dx+c\right)\log\left(\frac{cdg-bc+(d^2g-bd)x}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{cdg-bc+(d^2g-bd)x}{bc-ad}\right)}{bc-ad}+\frac{\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="maxima")
```

```
[Out] (log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log(-(d*x + c)*g/(b*x
 + a) + 1) + 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c))/(b*c - a*d)
 - (log(b*x + a)*log(((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g) + 1) +
 dilog(-((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g)))/(b*c - a*d) + (lo
g(d*x + c)*log((c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d) + 1) + dilog(-(c
*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d)))/(b*c - a*d) + (log(b*x + a)*log
((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))/(b*c -
 a*d)
```

Fricas [A]
time = 0.36, size = 38, normalized size = 1.41

$$\frac{\mathrm{Li}_2\left(\frac{cg+(dg-b)x-a}{bx+a}+1\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="fricas")
```

```
[Out] dilog((c*g + (d*g - b)*x - a)/(b*x + a) + 1)/(b*c - a*d)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(-\frac{cg}{a+bx}-\frac{dgx}{a+bx}+1\right)}{(a+bx)(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] Integral(log(-c*g/(a + b*x) - d*g*x/(a + b*x) + 1)/((a + b*x)*(c + d*x)), x
)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="giac")
[Out] integrate(log(-(d*x + c)*g/(b*x + a) + 1)/((b*x + a)*(d*x + c)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\ln\left(1-\frac{g\,\left(c+d\,x\right)}{a+b\,x}\right)}{\left(a+b\,x\right)\,\left(c+d\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(1 - (g*(c + d*x))/(a + b*x))/((a + b*x)*(c + d*x)),x)
[Out] int(log(1 - (g*(c + d*x))/(a + b*x))/((a + b*x)*(c + d*x)), x)
```

3.258 $\int \frac{\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=27

$$\frac{\mathrm{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

```
[Out] polylog(2,g*(d*x+c)/(b*x+a))/(-a*d+b*c)
```

Rubi [A]
time = 0.08, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.079$, Rules used = {2571, 2565, 2352}

$$\frac{\mathrm{PolyLog}\left(2, \frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

Antiderivative was successfully verified.

```
[In] Int[Log[(a - c*g + b*x - d*g*x)/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] PolyLog[2, (g*(c + d*x))/(a + b*x)]/(b*c - a*d)
```

Rule 2352

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[(-e^(-1))*PolyLo
g[2, 1 - c*x], x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2565

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*((f_.) + (g_.)*(x_))^(m_.)*((h_.) + (i_.)*(x_))^(q_.), x_Symbol
] :> Dist[(b*c - a*d)^(q + 1)*(i/d)^q, Subst[Int[(b*f - a*g - (d*f - c*g)*x
)^m*((A + B*Log[e*x^n])^p/(b - d*x)^(m + q + 2)), x], x, (a + b*x)/(c + d*x
)], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, A, B, n}, x] && NeQ[b*c - a*d,
0] && IntegersQ[m, q] && IGtQ[p, 0] && EqQ[d*h - c*i, 0]
```

Rule 2571

```
Int[((A_.) + Log[(e_.)*((u_)/(v_))^(n_.)]*(B_.))^(p_.)*(w_)^(m_.)*(y_)^(q_.
), x_Symbol] :> Int[ExpandToSum[w, x]^m*ExpandToSum[y, x]^q*(A + B*Log[e*(E
xpandToSum[u, x]/ExpandToSum[v, x])^n])^p, x] /; FreeQ[{e, A, B, m, n, p, q
}, x] && LinearQ[{u, v, w, y}, x] &&  !LinearMatchQ[{u, v, w, y}, x]
```

Rubi steps

$$\int \frac{\log \left(\frac{a-cg+bx-dgx}{a+bx}\right)}{(a+bx)(c+dx)} \, dx = \int \frac{\log \left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)} \, dx$$
$$= -\frac{g\text{Subst}\left(\int \frac{\log(x)}{1-x} \, dx, x, \frac{a-cg+(b-dg)x}{a+bx}\right)}{b(a-cg)-a(b-dg)}$$
$$= \frac{\text{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 320 vs. $2(27) = 54$.

time = 0.13, size = 320, normalized size = 11.85

$$\frac{\log^2\left(\frac{(bc-ad)g}{(b-dg)(a+bx)}\right) - 2\log\left(\frac{d(a+bx)}{-bc+ad}\right)\log(c+dx) + 2\log(c+dx)\log\left(-\frac{d(a-cg+bx-dgx)}{bc-ad}\right) + 2\log\left(\frac{(bc-ad)g}{(b-dg)(a+bx)}\right)\log\left(-\frac{b(a-cg+bx-dgx)}{(bc-ad)g}\right) - 2\log\left(\frac{(bc-ad)g}{(b-dg)(a+bx)}\right)\log\left(\frac{a-cg+bx-dgx}{a+bx}\right) - 2\log(c+dx)\log\left(\frac{a-cg+bx-dgx}{a+bx}\right) - 2\text{Li}_2\left(\frac{(b-dg)(a+bx)}{(bc-ad)g}\right) - 2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right) + 2\text{Li}_2\left(\frac{(b-dg)(c+dx)}{bc-ad}\right)}{2bc-2ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(a - c*g + b*x - d*g*x)/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] (Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]^2 - 2*Log[(d*(a + b*x))/(-(b*c)
 + a*d)]*Log[c + d*x] + 2*Log[c + d*x]*Log[-((d*(a - c*g + b*x - d*g*x))/(b
*c - a*d))] + 2*Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]*Log[-((b*(a - c*
g + b*x - d*g*x))/((b*c - a*d)*g))] - 2*Log[((b*c - a*d)*g)/((b - d*g)*(a +
 b*x))]*Log[(a - c*g + b*x - d*g*x)/(a + b*x)] - 2*Log[c + d*x]*Log[(a - c*
g + b*x - d*g*x)/(a + b*x)] - 2*PolyLog[2, ((b - d*g)*(a + b*x))/((b*c - a*
d)*g)] - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[2, ((b - d*g)*
(c + d*x))/(b*c - a*d)])/(2*b*c - 2*a*d)
```

Maple [A]
time = 0.74, size = 45, normalized size = 1.67

method	result	size
derivativedivides	$-\frac{\text{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-cb)}{b(bx+a)}\right)}{ad-cb}$	45
default	$-\frac{\text{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-cb)}{b(bx+a)}\right)}{ad-cb}$	45
risch	$-\frac{\text{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-cb)}{b(bx+a)}\right)}{ad-cb}$	45

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x,method=_RETURNVERBOSE)
```

```
[Out] -dilog((-d*g+b)/b+g*(a*d-b*c)/b/(b*x+a))/(a*d-b*c)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 343 vs. $2(26) = 52$.
time = 0.31, size = 343, normalized size = 12.70

$$\left(\frac{\log\left(bx+a\right)}{bc-ad}-\frac{\log\left(dx+c\right)}{bc-ad}\right)\log\left(-\frac{dgx+cg-bx-a}{bx+a}\right)+\frac{\log\left(bx+a\right)^{2}-2\,\log\left(bx+a\right)\log\left(dx+c\right)}{2\,\left(bc-ad\right)}-\frac{\log\left(bx+a\right)\log\left(\frac{(dg-b)a+(bdg-b^{2})x}{bcg-adg}+1\right)+\mathrm{Li}_2\left(-\frac{(dg-b)a+(bdg-b^{2})x}{bcg-adg}\right)}{bc-ad}+\frac{\log\left(dx+c\right)\log\left(\frac{cdg-bc+(d^{2}g-bd)x}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{cdg-bc+(d^{2}g-bd)x}{bc-ad}\right)}{bc-ad}+\frac{\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="max
ima")
```

```
[Out] (log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log(-(d*g*x + c*g - b
*x - a)/(b*x + a)) + 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c))/(b*
c - a*d) - (log(b*x + a)*log(((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g
) + 1) + dilog(-((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g)))/(b*c - a*
d) + (log(d*x + c)*log((c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d) + 1) + d
ilog(-(c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d)))/(b*c - a*d) + (log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)/(b*c - a*d)
```

Fricas [A]
time = 0.39, size = 38, normalized size = 1.41

$$\frac{\mathrm{Li}_2\left(\frac{cg+(dg-b)x-a}{bx+a}+1\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="fri
cas")
```

```
[Out] dilog((c*g + (d*g - b)*x - a)/(b*x + a) + 1)/(b*c - a*d)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="gia
c")
```

```
[Out] integrate(log(-(d*g*x + c*g - b*x - a)/(b*x + a))/((b*x + a)*(d*x + c)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\ln\left(\frac{a-c\,g+b\,x-d\,g\,x}{a+b\,x}\right)}{(a+b\,x)\,\left(c+d\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log((a - c*g + b*x - d*g*x)/(a + b*x))/((a + b*x)*(c + d*x)),x)
```

```
[Out] int(log((a - c*g + b*x - d*g*x)/(a + b*x))/((a + b*x)*(c + d*x)), x)
```

3.259 $\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{afh+bghx^2+h(bfx+agx)}\,dx$

Optimal. Leaf size=282

$$-\frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\log\left(1-\frac{(bf-ag)(c+dx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{3Bn\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\mathrm{Li}_2}{(bf-ag)h}$$

```
[Out] -(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3*ln(1-(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*
x+a))/(-a*g+b*f)/h+3*B*n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*polylog(2,(-a*
g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h+6*B^2*n^2*(A+B*ln(e*(b*x+a)
^n/((d*x+c)^n)))*polylog(3,(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f
)/h+6*B^3*n^3*polylog(4,(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h
```

Rubi [A]

time = 0.42, antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 51, $\frac{\text{number of rules}}{\text{integrand size}} = 0.157$, Rules used = {2573, 2576, 3, 1607, 2379, 2421, 2430, 6724}

$$\frac{6B^2n^2\mathrm{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h(bf-ag)}+\frac{3Bn\mathrm{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{h(bf-ag)}+\frac{6B^3n^3\mathrm{PolyLog}\left(4,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^3}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a*f*h + b*g*h*x^2 + h*(b*f*
x + a*g*x)),x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (3*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])^2*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a +
 b*x))])/((b*f - a*g)*h) + (6*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*
g)*h) + (6*B^3*n^3*PolyLog[4, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x
))])/((b*f - a*g)*h)
```

Rule 3

```
Int[(u_.)*((a_) + (c_.)*(x_)^(j_.) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :>
Int[u*(b*x^n + c*x^(2*n))^p, x] /; FreeQ[{a, b, c, n, p}, x] && EqQ[j, 2*n]
 && EqQ[a, 0]
```

Rule 1607

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2430

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[PolyLog[k + 1, e*x^q]*((a + b*Log[c*x^n])^p/q)
, x] - Dist[b*n*(p/q), Int[PolyLog[k + 1, e*x^q]*((a + b*Log[c*x^n])^(p - 1
)/x), x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rule 2576

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*(P2x_)^(m_.), x_Symbol] :> With[{f = Coeff[P2x, x, 0], g = Coef
f[P2x, x, 1], h = Coeff[P2x, x, 2]}, Dist[b*c - a*d, Subst[Int[(b^2*f - a*b
*g + a^2*h - (2*b*d*f - b*c*g - a*d*g + 2*a*c*h)*x + (d^2*f - c*d*g + c^2*h
)*x^2)^m*((A + B*Log[e*x^n])^p/(b - d*x)^(2*(m + 1))), x], x, (a + b*x)/(c
+ d*x)], x]] /; FreeQ[{a, b, c, d, e, A, B, n}, x] && PolyQ[P2x, x, 2] && N
eQ[b*c - a*d, 0] && IntegerQ[m] && IGtQ[p, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{afh+bghx^2+h(bfx+agx)}\,dx = \int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{h(a+bx)(f+gx)}\,dx$$

$$= \frac{\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)(f+gx)}\,dx}{h}$$

$$= \frac{\int \left(\frac{A^3}{(a+bx)(f+gx)} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} + \frac{3AB^2\log^2(e(a+bx)^n(c\text{-}}{(a+bx)(f+gx)}\right.}{h}$$

$$= \frac{A^3\int \frac{1}{(a+bx)(f+gx)}\,dx}{h} + \frac{(3A^2B)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\,dx}{h} + \frac{(3A}{}$$

$$= -\frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h} - \frac{3A}{}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+}{(bf}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+}{(bf}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+}{(bf}$$

Mathematica [F]
time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{afh+bghx^2+h(bfx+agx)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a*f*h + b*g*h*x^2 + h
*(b*f*x + a*g*x)),x]
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a*f*h + b*g*h*x^2 + h
*(b*f*x + a*g*x)), x]
```

Maple [F]
time = 0.53, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln\left(e(bx+a)^n(dx+c)^{-n}\right)\right)^3}{afh+bgh\,x^2+h\,(agx+bfx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x
)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x
)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="maxima")
```

```
[Out] A^3*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) - integra
te(-(B^3*log((b*x + a)^n)^3 - B^3*log((d*x + c)^n)^3 + 3*A^2*B + 3*A*B^2 +
B^3 + 3*(A*B^2 + B^3)*log((b*x + a)^n)^2 + 3*(B^3*log((b*x + a)^n) + A*B^2
+ B^3)*log((d*x + c)^n)^2 + 3*(A^2*B + 2*A*B^2 + B^3)*log((b*x + a)^n) - 3*
(B^3*log((b*x + a)^n)^2 + A^2*B + 2*A*B^2 + B^3 + 2*(A*B^2 + B^3)*log((b*x
+ a)^n))*log((d*x + c)^n))/(b*g*h*x^2 + a*f*h + (b*f*h + a*g*h)*x), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="fricas")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(b*g*h*x^2 +
 a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(a*f*h+b*g*h*x**2+h*(a*g*x
+b*f*x)),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*g*h*x^2 + a*f*h + (b*
f*x + a*g*x)*h), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^3}{h\,\left(a\,g\,x+b\,f\,x\right)+a\,f\,h+b\,g\,h\,x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(h*(a*g*x + b*f*x) + a*f*h +
 b*g*h*x^2),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(h*(a*g*x + b*f*x) + a*f*h +
 b*g*h*x^2), x)
```

3.260 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{afh+bghx^2+h(bfx+agx)}\,dx$

Optimal. Leaf size=203

$$-\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2\log\left(1-\frac{(bf-ag)(c+dx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{2Bn(A+B\log(e(a+bx)^n(c+dx)^{-n}))\,\mathrm{Li}_2\left(\right.}{(bf-ag)h}$$

```
[Out] -(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*ln(1-(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*
x+a))/(-a*g+b*f)/h+2*B*n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(2,(-a*g+
b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h+2*B^2*n^2*polylog(3,(-a*g+b*f
)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g+b*f)/h
```

Rubi [A]
time = 0.34, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 51, $\frac{\text{number of rules}}{\text{integrand size}} = 0.137$,
Rules used = {2573, 2576, 3, 1607, 2379, 2421, 6724}

$$\frac{2Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h(bf-ag)}+\frac{2B^2n^2\text{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a*f*h + b*g*h*x^2 + h*(b*f*
x + a*g*x)),x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (2*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b
*x))])/((b*f - a*g)*h) + (2*B^2*n^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*
f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rule 3

```
Int[(u_.)*((a_) + (c_.)*(x_)^(j_.) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :>
Int[u*(b*x^n + c*x^(2*n))^p, x] /; FreeQ[{a, b, c, n, p}, x] && EqQ[j, 2*n]
 && EqQ[a, 0]
```

Rule 1607

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
```

```
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2421

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> Simp[(-PolyLog[2, (-d)*f*x^m])*((a + b*Log[c
*x^n])^p/m), x] + Dist[b*n*(p/m), Int[PolyLog[2, (-d)*f*x^m]*((a + b*Log[c*
x^n])^(p - 1)/x), x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0
] && EqQ[d*e, 1]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rule 2576

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*(P2x_)^(m_.), x_Symbol] :> With[{f = Coeff[P2x, x, 0], g = Coef
f[P2x, x, 1], h = Coeff[P2x, x, 2]}, Dist[b*c - a*d, Subst[Int[(b^2*f - a*b
*g + a^2*h - (2*b*d*f - b*c*g - a*d*g + 2*a*c*h)*x + (d^2*f - c*d*g + c^2*h
)*x^2)^m*((A + B*Log[e*x^n])^p/(b - d*x)^(2*(m + 1))), x], x, (a + b*x)/(c
+ d*x)], x]] /; FreeQ[{a, b, c, d, e, A, B, n}, x] && PolyQ[P2x, x, 2] && N
eQ[b*c - a*d, 0] && IntegerQ[m] && IGtQ[p, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{afh+bghx^2+h(bfx+agx)}\,dx = \int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{h(a+bx)(f+gx)}\,dx$$

$$= \frac{\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)(f+gx)}\,dx}{h}$$

$$= \frac{\int \left(\frac{A^2}{(a+bx)(f+gx)} + \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} + \frac{B^2\log^2(e(a+bx)^n(c+dx)^{-}}{(a+bx)(f+gx)}\right.}{h}$$

$$= \frac{A^2\int \frac{1}{(a+bx)(f+gx)}\,dx}{h} + \frac{(2AB)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\,dx}{h} + \frac{B^2\int}{}$$

$$= -\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h} - \frac{B^2\log}{}$$

$$= \frac{A^2\log(a+bx)}{(bf-ag)h} - \frac{A^2\log(f+gx)}{(bf-ag)h} - \frac{2AB\log(e(a+bx)^n(c+d}{(bf-}$$

$$= \frac{A^2\log(a+bx)}{(bf-ag)h} - \frac{A^2\log(f+gx)}{(bf-ag)h} - \frac{2AB\log(e(a+bx)^n(c+d}{(bf-}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1415 vs. $2(203) = 406$.
time = 0.40, size = 1415, normalized size = 6.97

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a*f*h + b*g*h*x^2 + h
*(b*f*x + a*g*x)),x]
```

```
[Out] (3*Log[a + b*x]*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*
x)^n)/(c + d*x)^n]))^2 - 3*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log
[(e*(a + b*x)^n)/(c + d*x)^n]))^2*Log[f + g*x] + 3*B*n*(A + B*(-(n*Log[a +
b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n]))*(Log[a + b*x]^2
 - 2*(Log[a + b*x]*Log[(b*(f + g*x))/(b*f - a*g)] + PolyLog[2, (g*(a + b*x)
)/(-(b*f) + a*g)])) - 6*A*B*n*(Log[c + d*x]*(Log[(d*(a + b*x))/(-(b*c) + a*
d)] - Log[(d*(f + g*x))/(d*f - c*g)]) + PolyLog[2, (b*(c + d*x))/(b*c - a*d
)] - PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)]) + 6*B^2*n*(n*Log[a + b*x] -
n*Log[c + d*x] - Log[(e*(a + b*x)^n)/(c + d*x)^n])*(Log[c + d*x]*(Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[(d*(f + g*x))/(d*f - c*g)]) + PolyLog[2, (b*
(c + d*x))/(b*c - a*d)] - PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)]) + B^2*n
```

```
^2*(Log[a + b*x]^2*(Log[a + b*x] - 3*Log[(b*(f + g*x))/(b*f - a*g)]) - 6*Lo
g[a + b*x]*PolyLog[2, (g*(a + b*x))/(-(b*f) + a*g)] + 6*PolyLog[3, (g*(a +
b*x))/(-(b*f) + a*g)]) + 3*B^2*n^2*(Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c
 + d*x]^2 - Log[c + d*x]^2*Log[(d*(f + g*x))/(d*f - c*g)] + 2*Log[c + d*x]*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*Log[c + d*x]*PolyLog[2, (g*(c + d
*x))/(-(d*f) + c*g)] - 2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[
3, (g*(c + d*x))/(-(d*f) + c*g)]) - 6*B^2*n^2*((Log[a + b*x]^2*(Log[c + d*x
] - Log[(b*(c + d*x))/(b*c - a*d)]))/2 - Log[a + b*x]*Log[c + d*x]*Log[(b*(
f + g*x))/(b*f - a*g)] - (Log[(g*(c + d*x))/(-(d*f) + c*g)]*(-2*Log[a + b*x
] + Log[(g*(c + d*x))/(-(d*f) + c*g)])*(Log[(b*(f + g*x))/(b*f - a*g)] - Lo
g[(d*(f + g*x))/(d*f - c*g)]))/2 + Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[((
b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]*(Log[(b*(f + g*x))/(b*f - a*
g)] - Log[(d*(f + g*x))/(d*f - c*g)]) - (Log[((b*f - a*g)*(c + d*x))/((d*f
- c*g)*(a + b*x))]^2*(Log[(-(b*c) + a*d)/(d*(a + b*x))] + Log[(b*(f + g*x))
/(b*f - a*g)] - Log[((-(b*c) + a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))]))/2
 - Log[a + b*x]*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - (Log[c + d*x] -
Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])*PolyLog[2, (g*(a + b*
x))/(-(b*f) + a*g)] - (Log[a + b*x] + Log[((b*f - a*g)*(c + d*x))/((d*f - c
*g)*(a + b*x))])*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)] - Log[((b*f - a*g
)*(c + d*x))/((d*f - c*g)*(a + b*x))]*(PolyLog[2, (b*(c + d*x))/(d*(a + b*x
))] - PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]) + PolyLo
g[3, (d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[3, (g*(a + b*x))/(-(b*f) + a*g
)] + PolyLog[3, (g*(c + d*x))/(-(d*f) + c*g)] + PolyLog[3, (b*(c + d*x))/(d
*(a + b*x))] - PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])
)/(3*(b*f - a*g)*h)
```

Maple [F]
time = 0.55, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\ln \left(e(bx+a)^{n} \left(dx+c\right)^{-n}\right)\right)^{2}}{afh+bgh\,x^{2}+h\left(agx+bfx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x
)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x
)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="maxima")
```

```
[Out] A^2*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) + integra
te((B^2*log((b*x + a)^n)^2 + B^2*log((d*x + c)^n)^2 + 2*A*B + B^2 + 2*(A*B
+ B^2)*log((b*x + a)^n) - 2*(B^2*log((b*x + a)^n) + A*B + B^2)*log((d*x + c
)^n))/(b*g*h*x^2 + a*f*h + (b*f*h + a*g*h)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(a*f*h+b*g*h*x**2+h*(a*g*x
+b*f*x)),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*g*h*x^2 + a*f*h + (b*
f*x + a*g*x)*h), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^2}{h\,\left(a\,g\,x+b\,f\,x\right)+a\,f\,h+b\,g\,h\,x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(h*(a*g*x + b*f*x) + a*f*h +
 b*g*h*x^2),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(h*(a*g*x + b*f*x) + a*f*h +
 b*g*h*x^2), x)
```

3.261 $\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{afh+bghx^2+h(bfx+agx)}\,dx$

Optimal. Leaf size=123

$$-\frac{(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right))\log\left(1-\frac{(bf-ag)(c+dx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{Bn\text{Li}_2\left(\frac{(bf-ag)(c+dx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}$$

```
[Out] -(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*ln(1-(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+
a))/(-a*g+b*f)/h+B*n*polylog(2,(-a*g+b*f)*(d*x+c)/(-c*g+d*f)/(b*x+a))/(-a*g
+b*f)/h
```

Rubi [A]
time = 0.20, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}} = 0.122$, Rules used = {2573, 2576, 3, 1607, 2379, 2438}

$$\frac{Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a*f*h + b*g*h*x^2 + h*(b*f*x
+ a*g*x)),x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*Log[1 - ((b*f - a*g)*(c + d*x))
/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (B*n*PolyLog[2, ((b*f - a*g)*
(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rule 3

```
Int[(u_.)*((a_) + (c_.)*(x_)^(j_.) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :>
Int[u*(b*x^n + c*x^(2*n))^p, x] /; FreeQ[{a, b, c, n, p}, x] && EqQ[j, 2*n]
 && EqQ[a, 0]
```

Rule 1607

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2379

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> Simp[(-Log[1 + d/(e*x^r)])*((a + b*Log[c*x^n])^p/(d*r))
, x] + Dist[b*n*(p/(d*r)), Int[Log[1 + d/(e*x^r)]*((a + b*Log[c*x^n])^(p -
```

```
1)/x), x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2573

```
Int[((A_.) + Log[(e_.)*(u_)^(n_.)*(v_)^(mn_)]*(B_.))^(p_.)*(w_.), x_Symbol]
 :> Subst[Int[w*(A + B*Log[e*(u/v)^n])^p, x], e*(u/v)^n, e*(u^n/v^n)] /; Fr
eeQ[{e, A, B, n, p}, x] && EqQ[n + mn, 0] && LinearQ[{u, v}, x] &&  !Intege
rQ[n]
```

Rule 2576

```
Int[((A_.) + Log[(e_.)*(((a_.) + (b_.)*(x_))/((c_.) + (d_.)*(x_)))^(n_.)]*(
B_.))^(p_.)*(P2x_)^(m_.), x_Symbol] :> With[{f = Coeff[P2x, x, 0], g = Coef
f[P2x, x, 1], h = Coeff[P2x, x, 2]}, Dist[b*c - a*d, Subst[Int[(b^2*f - a*b
*g + a^2*h - (2*b*d*f - b*c*g - a*d*g + 2*a*c*h)*x + (d^2*f - c*d*g + c^2*h
)*x^2)^m*((A + B*Log[e*x^n])^p/(b - d*x)^(2*(m + 1))), x], x, (a + b*x)/(c
+ d*x)], x]] /; FreeQ[{a, b, c, d, e, A, B, n}, x] && PolyQ[P2x, x, 2] && N
eQ[b*c - a*d, 0] && IntegerQ[m] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{afh+bghx^2+h(bfx+agx)}\,dx = \int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h(a+bx)(f+gx)}\,dx$$

$$= \frac{\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(f+gx)}\,dx}{h}$$

$$= \frac{\int \left(\frac{A}{(a+bx)(f+gx)}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(f+gx)}\right)dx}{h}$$

$$= \frac{A\int \frac{1}{(a+bx)(f+gx)}\,dx}{h}+\frac{B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(f+gx)}\,dx}{h}$$

$$= -\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{(Ab)\int \frac{1}{a+bx}}{(bf-ag)}$$

$$= \frac{A\log(a+bx)}{(bf-ag)h}-\frac{A\log(f+gx)}{(bf-ag)h}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\mathrm{lo}}{(bf-ag)h}$$

$$= \frac{A\log(a+bx)}{(bf-ag)h}-\frac{A\log(f+gx)}{(bf-ag)h}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\mathrm{lo}}{(bf-ag)h}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 303 vs. 2(123) = 246.
time = 0.09, size = 303, normalized size = 2.46

$$-\frac{-2A\log(a+bx)+Bn\log^2(a+bx)-2Bn\log(a+bx)\log(c+dx)+2Bn\log\left(\frac{d(a+bx)}{-bc+ad}\right)\log(c+dx)-2B\log(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+2A\log(f+gx)-2Bn\log(a+bx)\log(f+gx)+2Bn\log(c+dx)\log(f+gx)+2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log(f+gx)+2Bn\log(a+bx)\log\left(\frac{b(f+gx)}{bf-ag}\right)-2Bn\log(c+dx)\log\left(\frac{d(f+gx)}{df-cg}\right)+2Bn\mathrm{Li}_2\left(\frac{g(a+bx)}{-bf+ag}\right)+2Bn\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)-2Bn\mathrm{Li}_2\left(\frac{g(c+dx)}{-df+cg}\right)}{(2bf-2ag)h}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a*f*h + b*g*h*x^2 + h*(
b*f*x + a*g*x)),x]
```

```
[Out] -((-2*A*Log[a + b*x] + B*n*Log[a + b*x]^2 - 2*B*n*Log[a + b*x]*Log[c + d*x]
 + 2*B*n*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] - 2*B*Log[a + b*x]*
Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*A*Log[f + g*x] - 2*B*n*Log[a + b*x]*Lo
g[f + g*x] + 2*B*n*Log[c + d*x]*Log[f + g*x] + 2*B*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]*Log[f + g*x] + 2*B*n*Log[a + b*x]*Log[(b*(f + g*x))/(b*f - a*g)] -
 2*B*n*Log[c + d*x]*Log[(d*(f + g*x))/(d*f - c*g)] + 2*B*n*PolyLog[2, (g*(a
 + b*x))/(-(b*f) + a*g)] + 2*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*
B*n*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)])/((2*b*f - 2*a*g)*h))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.72, size = 1447, normalized size = 11.76

method	result	size
risch	Expression too large to display	1447

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x,m
ethod=_RETURNVERBOSE)
```

```
[Out] 1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn
(I*(b*x+a)^n/((d*x+c)^n))-1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e)*csgn(I
*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I/h/(a*g-b*f)*l
n(b*x+a)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(
a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2
+1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((
d*x+c)^n)*(b*x+a)^n)^2-1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*c
sgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*e)*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e)
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/h*B*n/(a*g-b*f)*dilog((d*(g*x+f)+c*g-d
*f)/(c*g-d*f))-1/h*B*n/(a*g-b*f)*dilog((-a*d+c*b+(b*x+a)*d)/(-a*d+b*c))+1/h
/(a*g-b*f)*ln(g*x+f)*B*ln(e)-1/h/(a*g-b*f)*ln(b*x+a)*B*ln(e)+1/2*I/h/(a*g-b
*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I/
h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^
n)*(b*x+a)^n)^2+1/h*A/(a*g-b*f)*ln(g*x+f)-1/h*A/(a*g-b*f)*ln(b*x+a)-1/2*I/h
/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I/h/(a*g-b*
f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/h*B*n/(a*g-b*f)*dilog((
b*(g*x+f)+a*g-b*f)/(a*g-b*f))+1/2/h*B*n/(a*g-b*f)*ln(b*x+a)^2-1/h*B*ln((d*x
+c)^n)/(a*g-b*f)*ln(g*x+f)-1/h*B*ln((b*x+a)^n)/(a*g-b*f)*ln(b*x+a)+1/2*I/h/
(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)+1/h*B*ln((d*x+c)^n)/(a*g-b*f)*ln(b*x+a)-1/2*I/h/(a*g-
b*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/
((d*x+c)^n))+1/h*B/(a*g-b*f)*ln(g*x+f)*ln((b*x+a)^n)+1/2*I/h/(a*g-b*f)*ln(b
*x+a)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*
Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/h*B*n/(a*g-b*f)*ln(g*x+f)*ln((d*(g*x+f
)+c*g-d*f)/(c*g-d*f))-1/h*B*n/(a*g-b*f)*ln(b*x+a)*ln((-a*d+c*b+(b*x+a)*d)/(
-a*d+b*c))-1/h*B*n/(a*g-b*f)*ln(g*x+f)*ln((b*(g*x+f)+a*g-b*f)/(a*g-b*f))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*
x)),x, algorithm="maxima")
```

```
[Out] A*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) - B*integra
te(-(log((b*x + a)^n) - log((d*x + c)^n) + 1)/(b*g*h*x^2 + a*f*h + (b*f*h +
 a*g*h)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*
x)),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*g*h*x^2 + a*f*h + (b*f +
 a*g)*h*x), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(a*f*h+b*g*h*x**2+h*(a*g*x+b*
f*x)),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*
x)),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*g*h*x^2 + a*f*h + (b*f*
x + a*g*x)*h), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)}{h\,\left(a\,g\,x+b\,f\,x\right)+a\,f\,h+b\,g\,h\,x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(h*(a*g*x + b*f*x) + a*f*h + b
*g*h*x^2),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(h*(a*g*x + b*f*x) + a*f*h + b
*g*h*x^2), x)
```

3.262 $\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=83

$$\frac{\text{Subst}\left(\text{Int}\left(\frac{1}{(a+bx)(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)},x\right),e\left(\frac{a+bx}{c+dx}\right)^n,e(a+bx)^n(c+dx)^{-n}\right)}{h}$$

```
[Out] _eval(Unintegrable(1/(b*x+a)/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x),e*(
(b*x+a)/(d*x+c))^n = e*(b*x+a)^n/((d*x+c)^n))/h
```

Rubi [A]
time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(afh+bghx^2+h(bfx+agx))\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x)^n)/(
c + d*x)^n])),x]
```

```
[Out] Defer[Subst][Defer[Int][1/((a + b*x)*(f + g*x)*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])), x], e*((a + b*x)/(c + d*x))^n, (e*(a + b*x)^n)/(c + d*x)^n]/h
```

Rubi steps

$$\int \frac{1}{(afh+bghx^2+h(bfx+agx))\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx = \int \frac{1}{h(a+bx)(f+gx)\left(A+B\log\right.}$$
$$= \frac{\int \frac{1}{(a+bx)(f+gx)(A+B\log(e(a+bx)^n(c+}}{h}$$
$$= \frac{\int \left(\frac{b}{(bf-ag)(a+bx)(A+B\log(e(a+bx)^n(}\right.}{}$$
$$= \frac{b\int \frac{1}{(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-}}}{(bf-ag)h}$$

Mathematica [A]
time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{1}{(afh+bghx^2+h(bfx+agx))\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is not applicable to the result.

[In] Integrate[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]

[Out] Integrate[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x]

Maple [A]
time = 0.47, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(afh + bgh\,x^{2} + h\left(agx + bfx\right)\right)\left(A + B\ln\left(e\left(bx + a\right)^{n}\left(dx + c\right)^{-n}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)

[Out] int(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima")

[Out] integrate(1/((b*g*h*x^2 + a*f*h + (b*f*x + a*g*x)*h)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas")

[Out] integral(1/(A*b*g*h*x^2 + A*a*f*h + (A*b*f + A*a*g)*h*x + (B*b*g*h*x^2 + B*a*f*h + (B*b*f + B*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)), x)

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x**2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)**n/((d*x+c
)**n))),x)
```

```
[Out] Timed out
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n))),x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*h*x^2 + a*f*h + (b*f*x + a*g*x)*h)*(B*log((b*x + a)^n*e/(
d*x + c)^n) + A)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)\,\left(h\,\left(a\,g\,x+b\,f\,x\right)+a\,f\,h+b\,g\,h\,x^2\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(h*(a*g*x + b*f*x) + a*f*h
+ b*g*h*x^2)),x)
```

```
[Out] int(1/((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(h*(a*g*x + b*f*x) + a*f*h
+ b*g*h*x^2)), x)
```

3.263 $\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}\,dx$

Optimal. Leaf size=83

$$\frac{\text{Subst}\left(\text{Int}\left(\frac{1}{(a+bx)(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2},x\right),e\left(\frac{a+bx}{c+dx}\right)^n,e(a+bx)^n(c+dx)^{-n}\right)}{h}$$

```
[Out] _eval(Unintegrable(1/(b*x+a)/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x),e
*((b*x+a)/(d*x+c))^n = e*(b*x+a)^n/((d*x+c)^n))/h
```

Rubi [A]
time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(afh+bghx^2+h(bfx+agx))\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x)^n)/(
c + d*x)^n])^2),x]
```

```
[Out] Defer[Subst][Defer[Int][1/((a + b*x)*(f + g*x)*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2), x], e*((a + b*x)/(c + d*x))^n, (e*(a + b*x)^n)/(c + d*x)^n]/
h
```

Rubi steps

$$\int \frac{1}{(afh+bghx^2+h(bfx+agx))\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx = \int \frac{1}{h(a+bx)(f+gx)\left(A+B\log\right.}$$
$$= \frac{\int \frac{1}{(a+bx)(f+gx)(A+B\log(e(a+bx)^n(c+d}}{h}$$
$$= \frac{\int \left(\frac{b}{(bf-ag)(a+bx)(A+B\log(e(a+bx)^n(c}\right.}{}$$
$$= \frac{b\int \frac{1}{(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-n}}}{(bf-ag)h}$$

Mathematica [A]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{1}{(afh+bghx^2+h(bfx+agx))\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n])^2),x]
```

```
[Out] Integrate[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n])^2), x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(afh+bgh\,x^{2}+h\left(agx+bfx\right)\right)\left(A+B\ln\left(e\left(bx+a\right)^{n}\left(dx+c\right)^{-n}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2
,x)
```

```
[Out] int(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2
,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n)))^2,x, algorithm="maxima")
```

```
[Out] (d*f - c*g)*integrate(1/((b*c*f^2*h*n - a*d*f^2*h*n)*A*B + (b*c*f^2*h*n - a
*d*f^2*h*n)*B^2 + ((b*c*g^2*h*n - a*d*g^2*h*n)*A*B + (b*c*g^2*h*n - a*d*g^2
*h*n)*B^2)*x^2 + 2*((b*c*f*g*h*n - a*d*f*g*h*n)*A*B + (b*c*f*g*h*n - a*d*f*
g*h*n)*B^2)*x + ((b*c*g^2*h*n - a*d*g^2*h*n)*B^2*x^2 + 2*(b*c*f*g*h*n - a*d
*f*g*h*n)*B^2*x + (b*c*f^2*h*n - a*d*f^2*h*n)*B^2)*log((b*x + a)^n) - ((b*c
*g^2*h*n - a*d*g^2*h*n)*B^2*x^2 + 2*(b*c*f*g*h*n - a*d*f*g*h*n)*B^2*x + (b*
c*f^2*h*n - a*d*f^2*h*n)*B^2)*log((d*x + c)^n)), x) - (d*x + c)/((b*c*f*h*n
 - a*d*f*h*n)*A*B + (b*c*f*h*n - a*d*f*h*n)*B^2 + ((b*c*g*h*n - a*d*g*h*n)*
A*B + (b*c*g*h*n - a*d*g*h*n)*B^2)*x + ((b*c*g*h*n - a*d*g*h*n)*B^2*x + (b*
c*f*h*n - a*d*f*h*n)*B^2)*log((b*x + a)^n) - ((b*c*g*h*n - a*d*g*h*n)*B^2*x
 + (b*c*f*h*n - a*d*f*h*n)*B^2)*log((d*x + c)^n))
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(A^2*b*g*h*x^2 + A^2*a*f*h + (A^2*b*f + A^2*a*g)*h*x + (B^2*b*g*
h*x^2 + B^2*a*f*h + (B^2*b*f + B^2*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)
^2 + 2*(A*B*b*g*h*x^2 + A*B*a*f*h + (A*B*b*f + A*B*a*g)*h*x)*log((b*x + a)^
n*e/(d*x + c)^n)), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x**2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)**n/((d*x+c
)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*h*x^2 + a*f*h + (b*f*x + a*g*x)*h)*(B*log((b*x + a)^n*e/(
d*x + c)^n) + A)^2), x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^2\,\left(h\,\left(a\,g\,x+b\,f\,x\right)+a\,f\,h+b\,g\,h\,x^2\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2*(h*(a*g*x + b*f*x) + a*f*
h + b*g*h*x^2)),x)
```

```
[Out] int(1/((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2*(h*(a*g*x + b*f*x) + a*f*
h + b*g*h*x^2)), x)
```

Chapter 4

Appendix

Local contents

4.1 Download section 1770
4.2 Listing of Grading functions 1770

4.1 Download section

The following zip files contain the raw integrals used in this test.

Mathematica format Mathematica_syntax.zip

Maple and Mupad format Maple_syntax.zip

Sympy format SYMPY_syntax.zip

Sage math format SAGE_syntax.zip

4.2 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.2.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* Nasser: April 7,2022. add second output which gives reason for the grade *)
(*                        Small rewrite of logic in main function to make it*)
(*                        match Maple's logic. No change in functionality otherwise*)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*          GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)
```

```
GradeAntiderivative[result_,optimal_] := Module[{expnResult,expnOptimal,leafCountResult,leafC
    expnResult  = ExpnType[result];
    expnOptimal = ExpnType[optimal];
    leafCountResult = LeafCount[result];
    leafCountOptimal = LeafCount[optimal];

    (*Print["expnResult=",expnResult," expnOptimal=",expnOptimal];*)
    If[expnResult<=expnOptimal,
        If[Not[FreeQ[result,Complex]], (*result contains complex*)
            If[Not[FreeQ[optimal,Complex]], (*optimal contains complex*)
                If[leafCountResult<=2*leafCountOptimal,
                    finalresult={"A","none"}
                    ,(*ELSE*)
                    finalresult={"B","Both result and optimal contain complex but leaf count
                  ]
            ,(*ELSE*)
                finalresult={"C","Result contains complex when optimal does not."}
            ]
        ,(*ELSE*)(*result does not contains complex*)
            If[leafCountResult<=2*leafCountOptimal,
               finalresult={"A","none"}
            ,(*ELSE*)
               finalresult={"B","Leaf count is larger than twice the leaf count of optimal. $
              ]
        ]
    ,(*ELSE*) (*expnResult>expnOptimal*)
        If[FreeQ[result,Integrate] && FreeQ[result,Int],
            finalresult={"C","Result contains higher order function than in optimal. Order "<
            ,
            finalresult={"F","Contains unresolved integral."}
        ]
    ];

    finalresult
]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
```

```
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
```

```
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.2.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
#Nasser 4/07/2022   add second output which gives reason for the grade

GradeAntiderivative := proc(result,optimal)
local leaf_count_result,
        leaf_count_optimal,
        ExpnType_result,
        ExpnType_optimal,
        debug:=false;

        leaf_count_result:=leafcount(result);
        #do NOT call ExpnType() if leaf size is too large. Recursion problem
        if leaf_count_result > 500000 then
            return "B","result has leaf size over 500,000. Avoiding possible recursion issues
        fi;

        leaf_count_optimal := leafcount(optimal);
        ExpnType_result  := ExpnType(result);
        ExpnType_optimal := ExpnType(optimal);
```

```
        if debug then
            print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
        fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

    #This check below actually is not needed, since I only
    #call this grading only for passed integrals. i.e. I check
    #for "F" before calling this. But no harm of keeping it here.
    #just in case.


    if not type(result,freeof('int')) then
        return "F","Result contains unresolved integral";
    fi;


    if ExpnType_result<=ExpnType_optimal then
        if debug then
             print("ExpnType_result<=ExpnType_optimal");
        fi;
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                if debug then
                        print("both result and optimal complex");
                fi;
                if leaf_count_result<=2*leaf_count_optimal then
                    return "A","";
                else
                   return "B",cat("Both result and optimal contain complex but leaf count of re
                                   convert(leaf_count_result,string)," vs. $2 (",
                                   convert(leaf_count_optimal,string)," ) = ",convert(2*leaf_co
                end if
            else #result contains complex but optimal is not
                if debug then
                        print("result contains complex but optimal is not");
                fi;
                return "C","Result contains complex when optimal does not.";
            fi;
        else # result do not contain complex
```

```
             # this assumes optimal do not as well. No check is needed here.
            if debug then
                   print("result do not contain complex, this assumes optimal do not as well"
            fi;
            if leaf_count_result<=2*leaf_count_optimal then
                if debug then
                    print("leaf_count_result<=2*leaf_count_optimal");
                fi;
                return "A","";
            else
                if debug then
                    print("leaf_count_result>2*leaf_count_optimal");
                fi;
                return "B",cat("Leaf count of result is larger than twice the leaf count of o
                               convert(leaf_count_result,string),"$ vs. $2(",
                               convert(leaf_count_optimal,string),")=",convert(2*leaf_cou
            fi;
        fi;
    else #ExpnType(result) > ExpnType(optimal)
        if debug then
            print("ExpnType(result) > ExpnType(optimal)");
        fi;
        return "C",cat("Result contains higher order function than in optimal. Order ",
                       convert(ExpnType_result,string)," vs. order ",
                       convert(ExpnType_optimal,string),".");
    fi;

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
```

```
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
```

```
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.2.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
   #sympy do not have leaf count function. This is approximation
   return round(1.7*count_ops(expr))

def is_sqrt(expr):
   if isinstance(expr,Pow):
      if expr.args[1] == Rational(1,2):
         return True
      else:
         return False
   else:
      return False

def is_elementary_function(func):
   return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
         asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
         asinh,acosh,atanh,acoth,asech,acsch
      ]

def is_special_function(func):
   return func in [ erf,erfc,erfi,
          fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
          gamma,loggamma,digamma,zeta,polylog,LambertW,
          elliptic_f,elliptic_e,elliptic_pi,exp_polar
       ]

def is_hypergeometric_function(func):
   return func in [hyper]

def is_appell_function(func):
   return func in [appellf1]

def is_atom(expn):
   try:
      if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
        return True
      else:
        return False
```

```
    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))   #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):    #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):   #type(op(2,expn),'integer')
            return expnType(expn.args[0])    #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):   #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))   #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnT
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)   #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):   #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))   #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)    #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
```

```
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    #print ("Enter grade_antiderivative for sagemath")
    #print("Enter grade_antiderivative, result=",result," optimal=",optimal)

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    #print("leaf_count_result=",leaf_count_result)
    #print("leaf_count_optimal=",leaf_count_optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        grade = "F"
        grade_annotation =""
    else:
        if expnType_result <= expnType_optimal:
            if result.has(I):
                if optimal.has(I): #both result and optimal complex
                    if leaf_count_result <= 2*leaf_count_optimal:
                        grade = "A"
                        grade_annotation =""
                    else:
                        grade = "B"
                        grade_annotation ="Both result and optimal contain complex but leaf count of result is larger
                else: #result contains complex but optimal is not
                    grade = "C"
                    grade_annotation ="Result contains complex when optimal does not."
            else: # result do not contain complex, this assumes optimal do not as well
                if leaf_count_result <= 2*leaf_count_optimal:
                    grade = "A"
                    grade_annotation =""
                else:
                    grade = "B"
                    grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(lea
        else:
            grade = "C"
            grade_annotation ="Result contains higher order function than in optimal. Order "+str(ExpnType_re
```

```
#print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

return grade, grade_annotation
```

4.2.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#          Albert Rich to use with Sagemath. This is used to
#          grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#          'arctan2','floor','abs','log_integral'
#June 4, 2022 Made default grade_annotation "none" instead of "" due
#          issue later when reading the file.
#July 14, 2022. Added ellipticF. This is until they fix sagemath, then remove it.

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
   r"""
   Return the tree size of this expression.
   """
   #print("Enter tree_size, expr is ",expr)

   if expr not in SR:
      # deal with lists, tuples, vectors
      return 1 + sum(tree_size(a) for a in expr)
   expr = SR(expr)
   x, aa = expr.operator(), expr.operands()
   if x is None:
      return 1
   else:
      return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
   if expr.operator() == operator.pow:   #isinstance(expr,Pow):
      if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
         if debug: print ("expr is sqrt")
         return True
      else:
         return False
   else:
      return False
```

```
def is_elementary_function(func):
    #debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    #debug=False
    if debug:
        print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
          'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
          'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
          'polylog','lambert_w','elliptic_f','elliptic_e','ellipticF',
          'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in sagemath
```

```
def is_atom(expn):

    #debug=False
    if debug:
        print ("Enter is_atom, expn=",expn)

    if not hasattr(expn, 'parent'):
       return False


    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-
    try:
       if expn.parent() is SR:
          return expn.operator() is None
       if expn.parent() in (ZZ, QQ, AA, QQbar):
          return expn in expn.parent() # Should always return True
       if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
          return expn in expn.parent().base_ring() or expn in expn.parent().gens()

       return False

    except AttributeError as error:
       print("Exception,AttributeError in  is_atom")
       print ("cought exception" , type(error).___name___ )
       return False


def expnType(expn):

    if debug:
       print (">>>>>Enter expnType, expn=", expn)
       print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
       return 1
    elif type(expn)==list:   #isinstance(expn,list):
       return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
       if  type(expn.operands()[0])==Rational:  #type(isinstance(expn.args[0],Rational):
          return 1
       else:
          return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
    elif expn.operator() == operator.pow:    #isinstance(expn,Pow)
       if type(expn.operands()[1])==Integer:   #isinstance(expn.args[1],Integer)
          return expnType(expn.operands()[0])    #expnType(expn.args[0])
       elif type(expn.operands()[1])==Rational:   #isinstance(expn.args[1],Rational)
          if type(expn.operands()[0])==Rational:  #isinstance(expn.args[0],Rational)
```

```
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
    else:
        return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.op
elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinstan
    m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
    m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
    return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
    return max(3,expnType(expn.operands()[0]))
elif is_special_function(expn.operator()): #is_special_function(expn.func)
    m1 = max(map(expnType, expn.operands()))     #max(map(expnType, list(expn.args)))
    return max(4,m1)   #max(4,m1)
elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
    m1 = max(map(expnType, expn.operands()))     #max(map(expnType, list(expn.args)))
    return max(5,m1)   #max(5,m1)
elif is_appell_function(expn.operator()):
    m1 = max(map(expnType, expn.operands()))     #max(map(expnType, list(expn.args)))
    return max(6,m1)   #max(6,m1)
elif str(expn).find("Integral") != -1: #this will never happen, since it
        #is checked before calling the grading function that is passed.
        #but kept it here.
    m1 = max(map(expnType, expn.operands()))     #max(map(expnType, list(expn.args)))
    return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
else:
    return 9

#main function
def grade_antiderivative(result,optimal):


    if debug:
        print ("Enter grade_antiderivative for sagemath")
        print("Enter grade_antiderivative, result=",result)
        print("Enter grade_antiderivative, optimal=",optimal)
        print("type(anti)=",type(result))
        print("type(optimal)=",type(optimal))

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    #if debug: print ("leaf_count_result=", leaf_count_result, "leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)
```

```
if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",expnType_optimal)

if expnType_result <= expnType_optimal:
    if result.has(I):
        if optimal.has(I): #both result and optimal complex
            if leaf_count_result <= 2*leaf_count_optimal:
                grade = "A"
                grade_annotation ="none"
            else:
                grade = "B"
                grade_annotation ="Both result and optimal contain complex but leaf count of result is larger t
        else: #result contains complex but optimal is not
            grade = "C"
            grade_annotation ="Result contains complex when optimal does not."
    else: # result do not contain complex, this assumes optimal do not as well
        if leaf_count_result <= 2*leaf_count_optimal:
            grade = "A"
            grade_annotation ="none"
        else:
            grade = "B"
            grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(leaf_
else:
    grade = "C"
    grade_annotation ="Result contains higher order function than in optimal. Order "+str(expnType_resu


print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

return grade, grade_annotation
```